SUBJECT INDEX.

[References to the papers read before the Institute are indicated by the word *Paper* following the page number. The letter *P.* denotes a reference to a subject incidentally mentioned in a paper. The letters *D.* and *A.* denote references to discussions on papers and to the section dealing with abstracts respectively.]

ABRASIVE MATERIAL, Norbide, 445*A*.
ABRASIVES, flotation method of preparing for metallographic work, 507*A*.
AGE-HARDENING, metals, 476*A*.
AGEING :
  magnetic, iron, effect of oxygen, 477*A*.
  steel, 476*A*.
  steel, effect of deoxidation, 477*A*.
  steel, effect of nitrogen and oxygen, 477*A*.
AIR-CONDITIONING EQUIPMENT, corrosion, 527*A*.
AIR FURNACES, pulverised-coal-fired, 342*A*.
AIR PREHEATERS, corrosion, 526*A*.
AIRCRAFT CONSTRUCTION :
  alloy steels for, 495*A*.
  cracks in welded joints, 443*A*.
AIRCRAFT ENGINE PARTS, heat treatment, 424*A*.
ALITISED CAST IRON, 466*A*.
ALLIED PRODUCTS CORP., heat-treatment plant, 417*A*.
ALLOYS :
  aluminium-chromium-iron, melting point, 517*A*.
  chromium-aluminium-iron, properties, 518*A*.
  chromium-nickel, effect of hydrogen-nitrogen mixtures, 486*A*.
  chromium-nickel, properties, 518*A*.
  constitution, 506*A*.
  copper-nickel-iron, electrodeposition, 449*A*.
  electric resistance, properties, 505*A*, 517*A*, 518*A*.
  ferromagnetic, modulus of elasticity, effect of magnetisation, 471*A*.
  grain-size, 506*A*.
  heat-resistant, properties, 518*A*.
  iron-manganese, constitution, 514*A*.
  iron-manganese, transformation, 514*A*.
  iron-molybdenum, structure and composition, 516*A*.
ALLOYS (*contd.*)—
  iron-nickel, equilibria with iron-nickel silicates, 381*A*.
  iron-nickel, irreversibility, 515*A*.
  iron-nickel, magnetic properties, effect of structure, 503*A*.
  iron-nickel, spectrum analysis, 531*A*.
  iron-nickel, structure, 503*A*.
  iron-nickel-chromium, tempering effect of tension, 430*A*.
  iron-silicon, magnetic properties, 504*A*.
  iron-tungsten, structure and composition, 516*A*.
  nickel, determination of sulphur, 530*A*.
  nickel, use, automobile construction, 496*A*.
  nickel-chromium, use for electric resistance, 517*A*.
  nickel-cobalt-iron, properties at high temperatures, 486*A*.
  nickel-iron, drawing, 414*A*.
  tin, equilibrium diagram, 516*A*.
  tungsten-cobalt iron, stability at high temperatures, 485*A*.
ALOXITE REDMANOL, 373*A*.
ALTERNATING STRESS, notch sensitiveness of steel, 473*A*.
ALUMINA :
  effect in blast-furnace slag, desulphurising action, 357*A*.
  effect on phosphorus distribution in steelmaking, 39*P*.
ALUMINIUM :
  determination in chromium steel, 530*A*.
  effect in cast iron, 465*A*.
  effect in copper steel, corrosion, 525*A*.
  effect in steel, corrosion, 525*A*.
  effect in steel, grain-size, 493*A*.
ALUMINIUM-CHROMIUM-IRON ALLOYS, melting point, 517*A*.
ALUMINIUM COATINGS, 448*A*.
AMERICAN CAST IRON PIPE CO., pipe casting, 371*A*.

AMERICAN COAL, coking properties, 344*A*.
AMERICAN SPIRAL SPRING & MANUFACTURING CO., heat-treatment plant, 425*A*.
AMMONIA, recovery, 348*A*.
AMMONIA SYNTHESIS EQUIPMENT, metals for, 486*A*.
AMPCO METAL, 394*A*.
ANALYSIS :
fuel, 532*A*.
gas, apparatus, 532*A*.
iron and steel, 529*A*.
spectrum, 530*A*, 531*A*.
spectrum, iron-nickel alloys, 531*A*.
ANNEALING, bright, use of propane, 423*A*.
ANNEALING FURNACES, bright, 417*A*, 418*A*.
ANTIMONY, effect in enamels, 457*A*.
ARMCO IRON :
behaviour under deformation at high temperatures, 179*P*.
transformation, alpha-gamma, 512*A*.
ARMSTRONG, SIR W. G., WHITWORTH & CO., foundry plant, 368*A*.
ARSENIC :
effect on electrolytic-iron sheets, magnetic properties, 504*A*.
effect on iron, corrosion in sulphuric acid, 525*A*.
ASPHALT COATINGS for tanks, 458*A*.
ASSOCIATES, election, 9.
ASTON PROCESS, 359*A*.
ATMOSPHERES, controlled, heat-treatment furnaces, 418*A*.
AUSTENITE :
in alloy steel, 510*A*.
retained, cobalt high-speed steel, 430*A*.
transformation in alloy steel, effect of elements, 512*A*.
transformation, carbon steel, 513*A*.
transformation, initiatory period, 513*A*.
transformation temperature, hardened steel, 513*A*.
AUSTENITIC WELDING, Krupp process, 435*A*.
AUTOMOBILE AXLE GEARS, endurance, 492*A*.
AUTOMOBILE CASTINGS, German practice, 467*A*.
AUTOMOBILE CONSTRUCTION, use of nickel alloys, 496*A*.
AUTOMOBILE CRANKSHAFTS, production, 372*A*.
AUTOMOBILE PARTS :
flash welding, 438*A*.
AUTOMOBILE PARTS (*contd.*)—
pressing and stamping, 394*A*.
AUTUMN MEETING, proceedings, 1.

BADDESLEY COLLIERY, coal-cleaning plant, 341*A*.
BALLENTINE TESTING MACHINE, 479*A*.
BAR MILLS :
407*A*.
running-out time of bars, 404*A*.
BARS :
cold-drawn, production, 397*A*.
seam formation, effect of roll design, 398*A*.
BASIC ELECTRIC FURNACE PRACTICE : 385*A*.
slag control, 385*A*.
BASIC OPEN-HEARTH PROCESS, reactions, 381*A*.
BASIC PROCESS, distribution of phosphorus between metal and slag, 13, *Paper*.
BEARING METAL, penetration into steel, 43*P*.
BEARINGS :
adjustment, 400*A*.
anti-friction, 400*A*.
effect of roll-neck deflection on life, 400*A*.
maintenance, 401*A*.
roller, 400*A*.
roller, tempering, 417*A*, 428*A*.
Schöpf type, 402*A*.
self-aligning, 400*A*.
S.K.F. type, 401*A*.
Timken type, 401*A*.
Vereinigte Kugellagerfabriken type, 401*A*.
BELGIUM, blast-furnace practice, 354*A*.
BELLS, cast-steel, production, 372*A*.
BEND FATIGUE STRENGTH, stepped shafts, effect of fillets, 490*A*.
BEND TESTS, cast iron, 460*A*.
BENSON BOILER, 336*A*.
BENZOL :
recovery by refrigeration, 348*A*.
yield from coke-ovens, 344*A*, 345*A*.
BERYLLIUM :
cementation of iron, 418*A*.
desulphurisation of steel, 384*A*.
BESSEMER STEEL, manufacture and properties, 376*A*.
BESSEMER STEEL RAILS, properties, 501*A*.
BIBLIOGRAPHY :
539.
effect of nitrogen in steel, 392*A*.
fatigue of metals, 491*A*.

BIBLIOGRAPHY (*contd.*)—
oxygen determination in steel, 392*A*.
waste-heat recovery, 336*A*.
BIHAR AND ORISSA, coal deposits, 322*A*.
BILLET MILLS, 403*A*.
BILLETS :
deseaming, 411*A*.
optimum charge weight, 402*A*.
piercing, energy consumption, 409*A*.
BLACK PLATE, production, 405*A*.
BLAST, oxygen-enriched, 355*A*.
BLAST-FURNACE :
blowers, Pokorny type, 355*A*.
blowers, Scherbius system of control, 354*A*.
burdening of ore, 357*A*.
direct production of steel, 360*A*.
oxygen-enriched blast, 355*A*.
reducibility of sinter, 358*A*.
Russian, 354*A*.
silica-alumina ratio in ores, 357*A*.
slag control, 384*A*.
tap-hole gun, Brosius type, 354*A*.
BLAST-FURNACE PLANT, South African Iron and Steel Corp., 354*A*.
BLAST-FURNACE PRACTICE, Belgium and Luxemburg, 354*A*.
BLAST-FURNACE SLAG, desulphurising action, effect of alumina, 357*A*.
BLAST-FURNACE STOVES :
checkerwork, Hotspur system, 355*A*.
Simplex, 355*A*.
BLEEDING, steel, 480*A*.
BLOOMING MILLS, 403*A*.
BLOWERS :
blast-furnace, Pokorny type, 355*A*.
blast-furnace, Scherbius system of control, 354*A*.
BLOWHOLES, ingots, effect of casting temperature, 392*A*.
"B.M." ROLLING-MILLS, LTD., plant, 406*A*.
BOILER DRUMS :
alloy steel for, 500*A*.
occurrence of fissures, 500*A*.
BOILER PLATES, effect of cold-work, 482*A*.
BOILER STEEL, caustic embrittlement, 478*A*.
BOILERS :
Benson, 336*A*.
control, 336*A*.
heat transmission, 337*A*.
high-pressure, construction, 335*A*.
pulverised-coal-fired, use of electro-filters, 342*A*.
used in conjunction with carbonisation plant, 347*A*.
waste-heat, gas works practice, 336*A*.
BOILERS (*contd.*)—
waste-heat, open-hearth practice, 336*A*.
BOOK NOTICES, 534.
BRAKE DRUMS, production, 467*A*.
BRASS, endurance at low temperatures, 489*A*.
BRIDGES, fatigue, 492*A*.
BRIGHT STEEL, 495*A*.
BRIGHT STOCK, rolling, 404*A*.
BRIQUETTING, coal, 343*A*.
BRITISH CHILLED ROLL AND ENGINEERING CO., LTD., furnace plant, 342*A*.
BRITISH COAL, analyses and types, 338*A*.
BRITISH EMPIRE, mineral resources, 322*A*.
BRITTLENESS, temper, effect on penetration of white metals into steel, 62*P*.
BROSIUS CLAY GUN, 354*A*.
BROMINE, reaction with coal, 344*A*.
BRONZE, use for forging dies, 394*A*.
BRONZE OVERLAYS, welding to steel, 437*A*.
BUICK MOTOR CO., gear manufacture, 425*A*.
BULLARD-DUNN PICKLING PROCESS, 446*A*.
BURMA, natural gas, 322*A*.

CADMIUM, electrodeposition, 451*A*.
CADMIUM COATINGS, 448*A*.
CALORIFIC VALUE, determination, 333*A*.
CALORIMETERS, twin, 333*A*.
CANADA :
coal deposits, 322*A*.
mineral industry, 322*A*.
CAPILLARITY, coal, 338*A*.
CARBIDES, chromium and manganese, structure and composition, 508*A*.
CARBON :
action as reducing agent in acid slag reactions, 382*A*.
effect on ageing phenomenon, 476*A*.
effect in cast iron, machinability, 463*A*.
effect in iron-silicon alloys, magnetic properties, 504*A*.
effect on steel at high temperatures, 486*A*.
effect on steel wire, 415*A*.
CARBON DIOXIDE, corrosion of steel, 523*A*.
CARBON MONOXIDE, action in steel making, 383*A*.

CARBON STEEL :
creep, effect of time, 484*A*.
effect of degree of forging, 396*A*.
effect of grain-size, 508*A*.
Lüders lines, 475*A*.
oxidation, 422*A*.
penetration of molten white metals, 50*P*.
properties, 472*A*.
transformations, magnetic and austenite, 513*A*.
CARBONISATION, low-temperature, 346*A*.
CARBONISATION PLANT, used in conjunction with boilers, 347*A*.
CARBONISATION PROCESS, "Suncole," 347*A*.
CARBONYL IRON :
behaviour under deformation at high temperatures, 179*P*.
grain-growth, 508*A*.
transformation, alpha-gamma, 512*A*.
CARBURISATION, gaseous, 419*A*.
CASE-HARDENED GEARS, endurance, 488*A*.
CASE-HARDENED STEEL, effect of manganese, 420*A*.
CASE-HARDENING :
alloy steel, 420*A*.
Perliton compound, 419*A*.
Rapidcep compound, 419*A*.
selective, 419*A*.
Speedicase compound, 419*A*.
CASE-HARDENING PRACTICE, 419*A*.
CASE-HARDENING STEEL, characteristics, 420*A*.
CAST IRON :
alitised, 466*A*.
alloy, impact resistance, 460*A*.
alloy, properties, 466*A*.
alloy, use for machine tools, 467*A*.
austenitic grain-size, 462*A*.
bend tests, 460*A*.
Cecolloy, 364*A*.
chill, production, 368*A*.
chilling properties, 464*A*.
cupola and pulverised-coal-fired furnace compared, 362*A*.
effect of aluminium, 465*A*.
effect of copper, 465*A*.
effect of hydrogen, 466*A*.
effect of phosphorus, 466*A*.
effect of pouring temperature, 464*A*.
effect of superheating, 463*A*, 464*A*.
enamelling, 456*A*.
for enamelling, 456*A*.
endurance at low temperatures, 489*A*.
graphitisation, phase changes, 468*A*.
heat treatment, 431*A*.
CAST IRON (*contd.*)—
high-duty, manufacture, 364*A*.
Iamzite, 466*A*.
impact resistance, effect of elements, 460*A*.
machinability, 463*A*.
malleable, *see* Malleable Cast Iron.
manufacture in electric furnaces, 364*A*.
manufacture in Sesci furnaces, 363*A*.
Meehanite, endurance at low temperatures, 489*A*.
Meehanite, production, 374*A*.
nickel, thermal expansion, 462*A*.
nickel, use, automobile construction, 496*A*.
nitriding, 420*A*.
notch sensitivity, 460*A*.
properties, 460*A*, 506*A*.
properties, effect of prestressing, 461*A*.
properties at high temperatures, 461*A*.
ratio between transverse modulus of rupture and tensile strength, 459*A*.
refining, soda-ash process, 363*A*.
section susceptibility, effect of elements, 464*A*.
testing machine, 459*A*.
use, machine construction, 467*A*.
use, mining practice, 468*A*.
vanadium-titanium, 364*A*.
wear, 462*A*.
work of rupture, 461*A*.
CAST IRON ROOFING PLATES, 370*A*.
CAST IRON TEST BARS, 459*A*.
CAST-STEEL BELLS, production, 372*A*.
CAST-STEEL CRANKSHAFTS, production, 372*A*.
CASTING :
centrifugal, pipes, 370*A*.
centrifugal, piston cores, 371*A*.
CASTING PROCESS, multiple, 369*A*.
CASTING TEMPERATURE, effect on blowholes in ingots, 392*A*.
CASTINGS :
alloy-steel, production and properties, 371*A*.
automobile, German practice, 467*A*.
copper steel, properties, 497*A*.
fluidity, 371*A*.
intercrystalline cracking, 375*A*.
special, production, 367*A*.
sponginess and Léonard effect, 375*A*.
steel, contraction, 375*A*.
steel, effect of temperature gradients, 371*A*.
steel, heat treatment, 424*A*.
steel, production, 371*A*.

CASTINGS (*contd.*)—
steel, production in electric furnaces, 372*A*.
steel, welding, 440*A*.
steel, x-ray examination, 440*A*.
surface examination, 375*A*.
use of rotating moulds, 363*A*.
CAUSTIC EMBRITTLEMENT, boiler steel, 478*A*.
CECOLLOY CAST IRON, 364*A*.
CEMENTATION :
copper by tin, 419*A*.
iron by beryllium, 418*A*.
iron by tin, 419*A*.
nickel by tin, 419*A*.
CEMENTS, refractory, properties, 327*A*.
CHAINS, dredger-bucket, manganese steel for, 499*A*.
CHANCE FLOTATION PROCESS, 340*A*.
CHECKERWORK, Hotspur system, 355*A*.
CHEMICAL INDUSTRY, use of corrosion-resistant steel, 519*A*.
CHILLED ROLLS :
failure, 368*A*.
production, 368*A*, 369*A*.
CHILLING PROPERTIES, cast-iron, 464*A*.
CHINA, iron ore deposits, 324*A*.
CHROME BRICK, *see* Refractory Brick.
CHROME ORE DEPOSITS, South Slavia, 323*A*.
CHROMIUM :
determination in stainless steel, 529*A*.
effect in cast iron, impact resistance, 460*A*.
effect in cast iron, section susceptibility, 464*A*.
effect in copper steel, corrosion, 525*A*.
effect in steel, corrosion, 525*A*.
effect on steel wire, 415*A*.
electrodeposition, 450*A*, 451*A*.
CHROMIUM-ALUMINIUM-IRON ALLOYS, properties, 518*A*.
CHROMIUM CARBIDE, structure and composition, 508*A*.
CHROMIUM - MOLYBDENUM CAST - IRON ROLLS, failure, 368*A*.
CHROMIUM-MOLYBDENUM STEEL :
effect of hydrogen-nitrogen mixtures, 486*A*.
elastic limit, 471*A*.
use, oil refineries, 499*A*.
CHROMIUM-MOLYBDENUM STEEL TUBES, manufacture, 408*A*.
CHROMIUM-NICKEL ALLOYS :
effect of hydrogen-nitrogen mixtures, 486*A*.
properties, 518*A*.
CHROMIUM - NICKEL - MOLYBDENUM STEEL :
effect of degree of forging, 396*A*.
temper-brittleness, effect of phosphorus, 431*A*.
CHROMIUM-NICKEL STEEL :
impact resistance, effect of heating, 473*A*.
intergranular corrosion, effect of cold-work, 526*A*.
machining, use of silver steel tools, 481*A*.
oxidation, 422*A*.
temper-brittleness, effect of phosphorus, 431*A*.
CHROMIUM - SILICON - MOLYBDENUM STEEL, creep, effect of time, 485*A*.
CHROMIUM STEEL :
analysis, 530*A*.
austenite and martensite, 510*A*.
effect of nitrogen, 519*A*.
embrittlement, 478*A*.
oxidation, 422*A*.
RR-II, 518*A*.
temper-brittleness, effect of phosphorus, 431*A*.
transformation, austenite, 512*A*.
use, oil refineries, 499*A*.
CHROMIUM-TUNGSTEN STEEL, effect of hydrogen - nitrogen mixtures, 486*A*.
CHROMIUM-VANADIUM STEELS, effect of hydrogen - nitrogen mixtures, 486*A*.
CLEANING :
coal, 339*A*.
coal, Chance process, 340*A*.
coal, De Vooys process, 340*A*.
coal, slurry treatment, 341*A*.
gas, 351*A*.
gas, Simplex system, 351*A*.
metals, 445*A*.
CLOSELOY, 368*A*.
COAL :
American, coking properties, 344*A*.
briquetting, 343*A*.
British, analysis and types, 338*A*.
capillarity, 338*A*.
carbonisation, low-temperature, 346*A*.
cleaning, 339*A*.
cleaning, Chance process, 340*A*.
cleaning, De Vooys process, 340*A*.
cleaning, slurry treatment, 341*A*.
cokability, Pishel test, 343*A*.
de-dusting, 340*A*.
determination of nitrogen, 532*A*.
distillation, electrical, 347*A*.
flotation, 339*A*, 340*A*.

COAL (*contd.*)—
fusibility, 334*A*.
grading, 340*A*.
hydrogenation, 352*A*.
Indian, washability curves, 322*A*.
pulverised, combustion, 342*A*.
pulverised, utilisation, 342*A*.
reaction with bromine, 344*A*.
Saar, constituents, 343*A*.
sampling, 532*A*.
washing, Hoyois washer, 341*A*.
X-ray examination, 338*A*.
COAL ASH:
fusibility, 334*A*.
fusion temperature, determination, 333*A*.
softening temperature, determination, 333*A*.
COAL-CLEANING PLANT:
Baddesley Colliery, 341*A*.
Rising Sun Colliery, 341*A*.
Rockingham Colliery, 341*A*.
selection, 339*A*.
Silksworth Colliery, 341*A*.
COAL DEPOSITS:
Bihar and Orissa, 322*A*.
Montana, 323*A*.
New Brunswick, 322*A*.
COAL DUST, estimation of fusain, 339*A*.
COAL PARTICLES, shape and specific surface, 339*A*.
COATING, metals, 448*A*.
COATINGS:
aluminium, 448*A*.
anodic, specifications, 449*A*.
asphalt, for tanks, 458*A*.
cadmium, 448*A*.
cathodic, specifications, 449*A*.
electrodeposited, tests, 451*A*.
electrodeposited, thickness measurement, 451*A*.
lead, 448*A*.
nickel, 448*A*.
protective value, 448*A*.
sprayed-metal, hardness, 455*A*.
tin, 448*A*.
tin, electrodeposited, superimposed on tin plate, 453*A*.
tin, hot-dipped, 453*A*.
zinc, 448*A*.
zinc, immersion time *versus* quality, 452*A*.
zinc, porosity, 452*A*.
COAL TAR, sampling, 532*A*.
COBALT:
effect on ageing phenomenon, 476*A*.
effect in copper steel, corrosion, 525*A*.
COBALT ALLOYS, modulus of elasticity, effect of magnetisation, 471*A*.
COBALT HIGH-SPEED STEEL, retained austenite, 430*A*.
COBALT MAGNET STEEL, properties, 505*A*.
COBALT-MOLYBDENUM MAGNET STEEL, properties, 505*A*.
COBALT OXIDE, effect on reboiling in enamels, 457*A*.
COBALT-TITANIUM MAGNET STEEL, properties, 505*A*.
COBALTCHROM-PRK, 420*A*.
COGHLIN, B. J., CO., LTD., heat-treatment plant, 417*A*.
COKABILITY, coal, Pishel test, 343*A*.
COKE:
handling, 350*A*.
preparation and marketing, 349*A*.
properties, 349*A*.
reactivity, 349*A*.
screening, 413*A*.
COKE-OVEN GAS:
benzole recovery by refrigeration, 348*A*.
desulphurisation, 351*A*.
use, firing clay refractories, 327*A*.
COKE OVENS:
benzole yield, 344*A*, 345*A*.
doors, refractory bricks, 329*A*.
Otto, 345*A*.
producers for, 350*A*.
roof flues, Goldschmidt system, 344*A*, 345*A*.
roof flues, Tillmann system, 344*A*.
Still, 344*A*.
COKING PLANT, Mid-Durham Carbonisation Co., Ltd., 344*A*.
COKING PROCESS, Knowles, 346*A*.
COKING PROPERTIES, American coal, 344*A*.
COLD-DRAWN BARS, production, 397*A*.
COLD-DRAWN STEEL, endurance at low temperatures, 489*A*.
COLD-DRAWN WIRE, fatigue, effect of low-temperature heat treatment, 143, *Paper*.
COLD-ROLLING, strip, effect of roll diameter, 407*A*.
COLD-ROLLING MILLS, electric driving, 410*A*.
COLD-SHORTNESS, metals, 479*A*.
COLD-WORK:
effect on boiler plate, 482*A*.
effect on chromium-nickel steel, intergranular corrosion, 526*A*.
COLD-WORKED METALS, heat treatment, deformation of metal, 429*A*.

COMBUSTION :
gas, 334*A*.
propane, 353*A*.
pulverised coal, 342*A*.
COMPRESSIBILITY of solid bodies, 469*A*.
CONCENTRATION, titaniferous iron ore, 325*A*.
CONDUCTIVITY, thermal, sheets, 482*A*.
CONTAINERS, steel, for motor fuel, 444*A*.
CONTRACTION :
steel castings, 375*A*.
welds, 443*A*.
CONTROL :
boilers, 336*A*.
furnaces, 337*A*.
open-hearth furnaces, 331*A*, 337*A*.
temperature, 337*A*.
CONVEYORS :
gravity, 412*A*.
for strip, 413*A*.
COPPER :
cementation by tin, 419*A*.
diffusion of gases, 492*A*.
effect in cast iron, 465*A*.
effect in cast iron, impact resistance, 460*A*.
effect in cast iron, section susceptibility, 464*A*.
effect in steel, corrosion, 525*A*.
COPPER-LEAD, coating of steel strip, 454*A*.
COPPER - NICKEL - IRON ALLOYS, electrodeposition, 449*A*.
COPPER-NICKEL-IRON SYSTEM, 515*A*.
COPPER-NICKEL-MOLYBDENUM STEEL, properties, 496*A*.
COPPER STEEL :
corrosion, 526*A*.
corrosion, effect of elements, 525*A*.
corrosion, effect of phosphorus and tin, 517*A*.
COPPER-STEEL CASTINGS, properties, 497*A*.
COPPERHEADS, in enamels, 457*A*.
CORES :
drying, 366*A*.
loam, separation from castings, 365*A*.
production, 366*A*.
CORROSION :
air-conditioning equipment, 527*A*.
air preheaters, 526*A*.
copper steel, 526*A*.
copper steel, effect of elements, 525*A*.
copper steel, effect of phosphorus and tin, 517*A*.
intergranular, chromium-nickel steel, effect of cold-work, 526*A*.
iron, effect of hydroxy compounds, 523*A*.
CORROSION (*contd.*)—
iron in sulphuric acid, effect of arsenic, 525*A*.
marine, 526*A*.
metals in contact, 524*A*.
metals in oil refineries, 525*A*.
oxygen depolarisation, 521*A*.
sheets, 524*A*.
soil resistance and underground currents, 527*A*.
steel, effect of elements, 525*A*.
steel in oxygen and carbon dioxide solutions, 523*A*.
structural steel under stress, 524*A*.
tinplate, effect of sodium sulphite, 454*A*.
welds, 526*A*.
CORROSION PROBABILITY :
iron and steel, effect of composition, 520*A*.
metals, 520*A*.
CORROSION - RESISTANT STEEL, use, chemical industry, 519*A*.
CORROSION TESTS :
methods, 522*A*.
pipes, 522*A*.
CRACKING :
intercrystalline, castings, 375*A*.
surface, forgings, 396*A*.
CRACKS :
detection, Magnaflux method, 475*A*.
detection, magnetic methods, 476*A*.
grinding, formation, 481*A*.
CRANE HOOKS, fatigue, 491*A*.
CRANES, gears for, 390*A*.
CRANKSHAFT STEEL, damping capacity, 488*A*.
CRANKSHAFTS, cast-steel, production, 372*A*.
CREEP :
iron and steel, structural changes taking place, 179*P*.
metals, 484*A*.
steel, effect of time, 484*A*.
CREEP TESTING MACHINE, 184*P*.
CREEP TESTS, Rohn method, 484*A*.
CRUCIBLE FURNACES, 376*A*.
CRUSHING MACHINES, use of manganese steel, 497*A*.
CRYSTALS, iron, production, 508*A*.
CUPOLA LININGS, 329*A*.
CUPOLA SLAG, viscosity, 387*A*.
CUPOLAS :
auxiliary tuyeres, 362*A*.
balanced-blast, 362*A*.
calculation of charges, 362*A*.
metal losses, 363*A*.
mixtures, 363*A*.

CUPOLAS (*contd.*)—
oxidation and carburisation factors, 363*A*.
reactions, 363*A*.
CUTTING, structural steel, 444*A*.
CUTTING TESTS, tool steel, 481*A*.
CYLINDER COVERS, moulding, 369*A*.
CYLINDER LINERS :
production, 467*A*.
properties and tests, 467*A*.
CZECHOSLOVAKIA, mineral industry, 323*A*.

DAMPING CAPACITY, metals, 487*A*.
DECARBURISATION :
steel, effect of grain-size, 423*A*.
tool steel, 423*A*.
DEEP-DRAWING TESTS, sheets, effect of tool dimensions, 397*A*.
DEFECTS :
detection, Magnaflux method, 475*A*.
detection, magnetic methods, 476*A*.
DEFINITION, technical terms, 506*A*.
DEFORMATION :
effect on silico-manganese steel, tempering, 429*A*.
metals, during heat treatment, 429*A*.
metals at high temperatures, 179, *Paper*.
metals, liability to fissure, 396*A*.
relation to grain-size, 508*A*.
DE LAVAUD CASTING PROCESS, 370*A*.
DEOXIDATION :
effect on steel, ageing, 477*A*.
effect on steel, ferrite formation, 509*A*.
steel, 383*A*.
DESCALING, steel by sprays, 411*A*.
DESULPHURISATION :
coke-oven gas, 351*A*.
iron, 384*A*.
steel, 383*A*.
steel by beryllium, 384*A*.
steel by manganese, 384*A*.
DE VOOYS COAL-CLEANING PROCESS, 340*A*.
DIES :
forging, use of bronze, 394*A*.
wire-drawing, wear, 413*A*.
DIRECT PROCESSES, 359*A*.
DISTILLATION, coal, electrical, 347*A*.
DRAWING :
alloy steel, 415*A*.
high-speed steel, 414*A*.
nickel-iron alloys, 414*A*.
stainless steel, 415*A*.
wire, 413*A*.
DREDGER BUCKET CHAINS, manganese steel for, 499*A*.
DRILLS, rock, steels for, 499*A*.
DROP-FORGING PRACTICE, 395*A*.
DROP STAMPING, flow of material, 119*P*.
DRYING, moulds and cores, 366*A*.
DURALUMIN, endurance at low temperatures, 489*A*.
DUST, collection in foundries, 364*A*.
DWIGHT-LLOYD SINTERING PROCESS, 326*A*.

EISENWERKGESELLSCHAFT MAXIMILIANHÜTTE, iron ore deposits, 323*A*.
ELASTIC LIMIT, structural steel, 470*A*.
ELASTIC PROPERTIES, steel, 470*A*.
" ELASTICITY FACTOR," 492*A*.
ELASTICITY MODULUS, ferromagnetic materials, effect of magnetisation, 471*A*.
ELECTRIC DRIVING, rolling mills, 410*A*.
ELECTRIC FURNACE PRACTICE :
basic, 385*A*.,
basic, slag control, 385*A*.
ELECTRIC FURNACES :
arc, 385*A*.
high-frequency, effect of condition of charge on power absorption, 386*A*.
high-frequency, history of development, 385*A*.
high-frequency, operation and design, 385*A*.
induction, 385*A*.
insulation, 331*A*.
manufacture of cast iron, 364*A*.
manufacture of steel castings, 372*A*.
ELECTRIC MOTORS :
circuit breakers, 410*A*.
selection for steel mills, 410*A*, 411*A*.
ELECTRIC POWER, Russian steel plants, 337*A*.
ELECTRIC RESISTANCE ALLOYS, properties, 505*A*, 517*A*, 518*A*.
ELECTRICAL PROPERTIES, electrolytic iron sheets, 503*A*.
ELECTROCHEMICAL POTENTIAL :
iron, 520*A*.
iron in nitric acid, 521*A*.
ELECTRODEPOSITED COATINGS :
tests, 451*A*.
thickness measurement, 451*A*.
ELECTRODEPOSITION :
cadmium, 451*A*.
chromium, 450*A*, 451*A*.
copper-nickel-iron alloys, 449*A*.
development, 448*A*.

ELECTRODEPOSITION (*contd.*)—
nickel, 451*A*.
tin, use of alkaline stannate baths, 450*A*.
ELECTRODES :
for arc welding, 433*A*.
for spot welding, 432*A*.
ELECTROLYTIC IRON :
transformation, alpha-gamma, 512*A*.
transformations, heat evolutions, 511*A*.
ELECTROLYTIC IRON SHEETS, magnetic properties, 503*A*.
ELECTROLYTIC PICKLING, 446*A*.
ELECTROMAGNETIC FATIGUE TESTING MACHINE, 487*A*.
ELECTROMAGNETIC TESTS, wire ropes, 482*A*.
ELFURNO ATMOSPHERE, for heat-treatment furnaces, 423*A*.
EMBRITTLEMENT :
caustic, boiler steel, 478*A*.
chromium steel, 478*A*.
EMLYN ANTHRACITE CO., LTD., slurry treatment, 342*A*.
ENAMELLING :
cast iron, 456*A*.
cast iron for, 456*A*.
effect of furnace atmosphere and temperature gradients, 456*A*.
sheets, 456*A*.
use of nickel dip, 456*A*.
ENAMELS :
adherence, 457*A*.
antimony-bearing, 457*A*.
copperheads, 457*A*.
draining qualities, 457*A*.
firing, 456*A*.
grinding, 457*A*.
opacity, 457*A*.
reboiling, effect of cobalt and nickel oxides, 457*A*.
ENDURANCE :
automobile axle gears, 492*A*.
case-hardened gears, 488*A*.
metals at low temperatures, 489*A*.
ENDURANCE LIMIT, malleable cast iron, 468*A*.
ENGINE PARTS, fatigue, 491*A*.
ENGINE SEATING STRUCTURES, welding, 437*A*.
ERHARDT TUBE PROCESS, 409*A*.
ETCHING REAGENT, stainless steel, use of oxalic acid, 506*A*.
EUROPE, mineral resources, 322*A*.
EXPANSION, thermal, nickel cast iron, 462*A*.
EXTENSOMETER, Martens-Hesse, 469*A*.
EXTRUSION :
ferrous metals, 397*A*.
tubes, 409*A*.

"FACTOR OF ELASTICITY," 492*A*.
FATIGUE :
bridges, 492*A*.
cold-drawn wire, effect of low-temperature heat treatment, 143, *Paper*.
crane hooks, 491*A*.
damping capacity, 487*A*.
marine engine parts, 491*A*.
metals, bibliography, 491*A*.
wire, effect of oils and greases, 491*A*.
FATIGUE STRENGTH :
bend, stepped shafts, effect of fillets, 490*A*.
notch, calculation from tensile strength and reduction of area, 488*A*.
FATIGUE TESTING MACHINE :
electromagnetic, 487*A*.
Haigh-Robertson, 487*A*.
rotating-beam, 487*A*.
for small-diameter wire, 486*A*.
FATIGUE TESTS :
load-deflection, 488*A*.
metals at low temperatures, 489*A*.
welds, 441*A*, 442*A*.
FERRITE, formation in steel, effect of deoxidation, 509*A*.
FERROLITE PICKLING PROCESS, 447*A*.
FERROMAGNETIC MATERIALS, modulus of elasticity, effect of magnetisation, 471*A*.
FERROSOFERRIC - OXIDE/FERRIC-OXIDE /OXYGEN EQUILIBRIA, 421*A*.
FERROUS OXIDE, reaction with hydrogen in liquid iron, 380*A*.
FERROUS - OXIDE/MANGANOUS - OXIDE/SILICA SYSTEM, 388*A*.
FIREBRICK, *see* Refractory Brick.
FISSURES :
occurrence in boiler drums, 500*A*.
occurrence in metals during deformation, 396*A*.
occurrence in rails, 501*A*.
FLAMES :
luminous, use for heating, 335*A*.
temperature, effect of dissociation, 334*A*.
temperature and radiation, 335*A*.
FLOTATION, coal, 339*A*, 340*A*.
FLOW :
metals, effect of inclusions, 122*P*.
metals, investigation by Hele-Shaw apparatus, 117, *Paper*.

FLOW (*contd.*)—
metals in rolling, roll-opening phenomenon, 398*A*.
FLUIDITY, castings, 371*A*.
FLUXES, for galvanising, 452*A*.
FLYWHEEL HUBS, moulding, 370*A*
FOLDING TESTS, welds, 441*A*.
FORD MOTOR CO.:
coating of steel strip with copper-lead, 454*A*.
foundry plant, 374*A*.
production of cast-steel crankshafts, 372*A*.
FOREN TUBE PROCESS, 408*A*.
FORGE FURNACES, design, 393*A*.
FORGE TESTS, welds, 441*A*.
FORGING:
degree of, effect on structural steel, 396*A*.
stainless steel, 395*A*.
FORGING DIES, use of bronze, 394*A*.
FORGING PRESSES, 394*A*.
FORGING STEEL, manufacture, slag control, 385*A*.
FORGINGS:
drop, production, 395*A*.
heat-treatment, 425*A*.
manipulators for, 395*A*.
steel, production, 395*A*.
surface cracking, 396*A*.
FORSTERITE, properties, 328*A*.
FOUNDRIES:
dust collection, 364*A*.
floor vibrations, 364*A*.
refractory materials, 329*A*.
FOUNDRY PLANT:
Sir W. G. Armstrong, Whitworth & Co., 368*A*.
Ford Motor Co., 374*A*.
John Harper & Co., Ltd., 374*A*.
Homestead Valve Co., 374*A*.
Kryn and Lahy, Ltd., 374*A*.
Mackintosh-Hemphill Co., 369*A*.
Newton, Chambers & Co., Ltd., 374*A*.
Sheepbridge Stokes Centrifugal Castings Co., Ltd., 373*A*.
Sterling Foundry Co., 375*A*.
Winget, Ltd., 374*A*.
FOUNDRY PRACTICE, 362*A*.
FOX, SAMUEL, & CO., LTD., plant, 389*A*.
FRANCE:
mineral deposits, 322*A*.
specification for weld metal, 434*A*.
FREE-CUTTING STEEL, 494*A*, 495*A*.
FRICTIONAL OXIDATION, steel, 481*A*.
FRIEDRICH-WILHELMS HÜTTE, gas measurement, 337*A*.
FUEL:
analysis, 532*A*.
FUEL (*contd.*)—
determination of calorific value, 333*A*.
pulverised, *see* Coal, pulverised.
FUEL EFFICIENCY, iron industry, 336*A*.
FURNACE ATMOSPHERES, effect on molybdenum high-speed steel, grain-size, 322*A*.
FURNACES:
blast, *see* Blast-Furnaces.
control, 337*A*.
convection heating, 335*A*.
forge, *see* Forge Furnaces.
fuel beds, 335*A*.
heat development, calculation, 334*A*.
heat losses, calculation, 337*A*.
heat-treatment, *see* Heat-Treatment Furnaces.
high-frequency, *see* Electric Furnaces.
luminous flame heating, 335*A*.
malleable-iron, refractory materials, 330*A*.
open-hearth, *see* Open-Hearth Furnaces.
pulverised-coal-fired, 342*A*.
radiant-tube heating, 418*A*.
reheating, *see* Reheating Furnaces.
selection of heat-resistant steel, 519*A*.
Sesci, 363*A*.
FUSAIN, estimation in coal dust, 339*A*.
FUSION TEMPERATURE, coal ash, determination, 333*A*.

GALVANISING:
fluxes, 452*A*.
immersion time *versus* quality of coatings, 452*A*.
residuum losses, 452*A*.
use of zinc ammonium chloride, 451*A*.
GANTT METHOD of diagrammatic representation, 405*A*.
GAS:
analysis, apparatus, 532*A*.
cleaning, 351*A*.
cleaning, Simplex system, 351*A*.
combustion, 334*A*.
de-dusting, 350*A*.
determination of naphthalene, 532*A*.
measurement, 337*A*.
use for carburising, 419*A*.
GAS PRODUCERS, *see* Producers.
GAS WORKS PRACTICE, waste-heat boilers, 336*A*.
GASES:
diffusion through metals, 492*A*.
extraction from metals, 532*A*.

GASES (*contd.*)—
formation in steel, relation to segregation, 392*A*.
in steel, 383*A*, 392*A*.
GASHOLDER, Klönne, 352*A*.
GATES for moulds, 365*A*.
GEARS:
automobile, endurance, 492*A*.
case-hardened, endurance, 488*A*.
for cranes, 390*A*.
heat treatment, 425*A*.
GERMANY:
automobile castings, 467*A*.
iron ore deposits, 322*A*.
iron ore reserves, 323*A*.
GIRDERS, welded-plate, 440*A*.
GLASS SILK, use for insulation, 332*A*.
GLUCINUM, *see* Beryllium.
GOLD DEPOSITS, France, 322*A*.
GOLDSCHMIDT FLUES for coke-ovens, 344*A*, 345*A*.
GRAIN DISTORTION, in heat treatment, 424*A*.
GRAIN-GROWTH:
carbonyl iron, 508*A*.
theory, 508*A*.
GRAIN-SIZE:
alloys, 506*A*.
austenitic, cast iron, 462*A*.
effect on carbon steel, 508*A*.
effect on electrolytic iron sheets, magnetic properties, 504*A*.
effect on iron-silicon alloys, magnetic properties, 504*A*.
effect on penetration of white metals into steel, 58*P*, 61*P*.
effect on steel, decarburisation, 423*A*.
molybdenum high-speed steel, effect of furnace atmosphere, 422*A*.
steel, effect of aluminium, 493*A*.
steel, relation to hot-work, 508*A*.
GRANODISING PROCESS, 455*A*.
GRAPHITISATION, cast iron, phase changes, 468*A*.
GREASE, effect on wire, fatigue strength, 491*A*.
GRINDING CRACKS, formation, 481*A*.
GRINDING WHEELS, specification, British, 503*A*.

HACK SAW BLADES, hardening, 428*A*.
HADFIELDS, LTD., plant, 390*A*.
HAIGH-ROBERTSON FATIGUE TESTING MACHINE, 487*A*.
HANDLING:
coke, 350*A*.
iron ore, 326*A*.
HANDLING EQUIPMENT for steel mills, 413*A*.
HARDENED STEEL, transformation temperatures of austenite and martensite, 513*A*.
HARDENING:
age, metals, 476*A*.
hack-saw blades, 428*A*.
steel, 426*A*.
surface, rolls, 369*A*.
surface, Shorterising process, 420*A*.
tool steel, 426*A*, 508*A*.
HARDENING FURNACES, 417*A*.
HARDNESS:
nickel-manganese steel, 99*P*.
sprayed-metal coatings, 455*A*.
welds, 442*A*.
HARDNESS TESTING MACHINE, Ballentine, 479*A*.
HARDNESS TESTS, nitrided steel, 479*A*.
HARPER, JOHN, & CO., LTD., foundry plant, 374*A*.
HARTMANN LINES, 75*P*.
HAULAGE ROPES:
deterioration in service, 498*A*.
electromagnetic tests, 482*A*.
HEAT:
development in furnaces, calculation, 334*A*.
evolution, transformations in iron, 511*A*.
waste, recovery, bibliography, 336*A*.
HEAT BALANCE, open-hearth furnaces, 378*A*.
HEAT EXCHANGERS:
calculation, 338*A*.
cross-current, 338*A*.
HEAT LOSSES, furnaces, calculation, 337*A*.
HEAT-RESISTANT ALLOYS, properties, 518*A*.
HEAT-RESISTANT STEEL, selection for furnaces, 519*A*.
HEAT TRANSMISSION, boilers, 337*A*.
HEAT TREATMENT:
aircraft engine parts, 424*A*.
cast iron, 431*A*.
cold-worked metals, deformation of metal, 429*A*.
forgings, 425*A*.
gears, 425*A*.
grain distortion, 424*A*.
low-temperature, effect on cold-drawn wire, fatigue, 143, *Paper*.
malleable cast iron, 431*A*.
molybdenum high-speed steel, 427*A*.
rails, 425*A*.
springs, 417*A*, 425*A*.
steel castings, 424*A*.

HEAT TREATMENT (*contd.*)—
tool steel, 417*A*, 427*A*.
HEAT-TREATMENT FURNACES :
417*A*.
controlled atmospheres, 418*A*.
electric, 417*A*.
Elfurno gas atmosphere, 423*A*.
forced convection heating, 423*A*.
HELE-SHAW APPARATUS for investigating flow of metals, 117, *Paper*.
HIGH-FREQUENCY FURNACES, *see* Electric Furnaces.
HIGH-SPEED STEEL :
cobalt, retained austenite, 430*A*.
determination of sulphur, 530*A*.
drawing, 414*A*.
molybdenum, grain-size, effect of furnace atmosphere, 422*A*.
molybdenum, heat treatment, 427*A*.
molybdenum, properties, 494*A*.
HISTORY, iron, 361*A*.
HOISTING DRUM, moulding, 369*A*.
HOLES, stress concentration, 281*A*.
HOMESTEAD VALVE CO., foundry plant, 374*A*.
HOOKS, crane, fatigue, 491*A*.
HOTSPUR CHECKERBRICK, 355*A*.
HOYOIS COAL WASHERY, 341*A*.
HYDROGEN :
behaviour in steel making, 383*A*.
diffusion in pickling, 447*A*.
effect on cast iron, 466*A*.
reaction with ferrous oxide in liquid iron, 380*A*.
HYDROGEN - NITROGEN MIXTURES, effect on steel, 486*A*.
HYDROGENATION :
coal, 352*A*.
tar, 352*A*.

IAMZITE CAST IRON, 466*A*.
ILLINOIS STEEL CO., heat treatment of rails, 425*A*.
ILSEDER HÜTTE, ore-loading plant, 326*A*.
IMPACT RESISTANCE :
cast iron, effect of elements, 460*A*.
chromium-nickel steel, effect of heating, 473*A*.
nickel-manganese steel, 99*P*.
nickel steel at low temperatures, 473*A*.
tool steels, 474*A*.
IMPACT TEST-BARS, notched, standardisation, 472*A*.
IMPACT TESTING MACHINE, Oxford, 472*A*.
IMPACT TESTS, welds, 441*A*.

INCLUSIONS :
effect on flow of metals, 122*P*.
identification and composition, 237. *Paper*.
in molybdenum steel, 275*D*.
origin and formation, 392*A*.
in steel, 392*A*.
INDIA, coal deposits, 322*A*.
INDIAN COAL, washability curves, 322*A*.
INGOT MOULDS :
copper stools, 391*A*.
effect of composition on life and cost, 391*A*.
INGOTS :
blowholes, effect of casting temperature, 392*A*.
effect of mould design, 392*A*.
feeder heads, 391*A*.
heating in soaking pits, 393*A*.
heterogeneity, 392*A*.
teeming speeds, effect of nozzle refractories, 391*A*.
INHIBITORS, use in pickling, 447*A*.
INLAND STEEL CO., grinding refractory materials, 328*A*.
INSPECTION, engineering materials, 506*A*.
INSULATING BRICKS :
properties, 327*A*.
for reheating furnaces, 330*A*.
INSULATING MATERIAL :
glass silk, 332*A*.
properties, 331*A*.
INSULATION :
electric furnaces, 331*A*.
open-hearth furnaces, 331*A*.
IRON :
analysis, 529*A*.
carbonyl, grain-growth, 508*A*.
carbonyl, transformation, alpha-gamma, 512*A*.
cementation by beryllium, 418*A*.
cementation by tin, 419*A*.
corrosion, effect of hydroxy compounds, 523*A*.
corrosion in sulphuric acid, effect of arsenic, 525*A*.
corrosion probability, effect of composition, 520*A*.
creep, structural changes taking place, 179*P*.
desulphurisation, 384*A*.
diffusion of gases, 492*A*.
direct production, 359*A*.
electrochemical potential, 520*A*.
electrochemical potential, in nitric acid, 521*A*.
estimation in presence of titanium, 529*A*.

IRON (*contd*)—
history, 361*A*.
liquid, oxygen-phosphorus equilibrium, 358*A*.
liquid, reaction of hydrogen with ferrous oxide, 380*A*.
liquid, temperature measurement, 379*A*.
magnetic ageing, effect of oxygen, 477*A*.
Piobert effect, 75, *Paper*.
production, 354*A*.
scaling, 421*A*.
tensile tests at high temperature, structural changes taking place, 179*P*.
transformation, 511*A*.
transformation, alpha-gamma, 511*A*, 512*A*.
transformations, heat evolution, 511*A*.
IRON ALLOYS, modulus of elasticity, effect of magnetisation, 471*A*.
IRON-CARBON-SULPHUR SYSTEM, 384*A*.
IRON-CARBON-TIN SYSTEM, 514*A*.
IRON CRYSTALS, production, 508*A*.
IRON INDUSTRY:
fuel efficiency, 336*A*.
Russia, electrification, 337*A*.
IRON / IRON - SULPHIDE / MANGANESE / MANGANESE-SULPHIDE SYSTEM, 384*A*.
IRON-MANGANESE ALLOYS:
constitution, 514*A*.
transformations, 514*A*.
IRON-MOLYBDENUM ALLOYS, structure and composition, 516*A*.
IRON-MOLYBDENUM SYSTEM, solidus temperature, 516*A*.
IRON-NICKEL ALLOYS:
equilibria with iron-nickel silicates, 381*A*.
irreversibility, 515*A*.
magnetic properties, effect of structure, 503*A*.
structure, 503*A*.
IRON-NICKEL-CHROMIUM ALLOYS, tempering, effect of tension, 430*A*.
IRON-NICKEL DIAGRAM, 515*A*.
IRON-NICKEL SILICATES, equilibria with iron-nickel alloys, 381*A*.
IRON ORE:
burdening for blast-furnace, 357*A*.
handling, 326*A*.
silica-alumina ratio, 357*A*.
sintering, Dwight-Lloyd system, 326*A*.
sintering, Saint-Jacques furnace, 325*A*.
titaniferous, concentration, 325*A*.
IRON ORE DEPOSITS:
China, 324*A*.
Dogger Sandstone, 323*A*.
Germany, 322*A*.
Siegerland, formation, 323*A*.
IRON-OXYGEN EQUILIBRIUM, 72*D*.
IRON - PHOSPHORUS - OXYGEN SYSTEM, 515*A*.
IRON-SILICON ALLOYS:
magnetic properties, 504*A*.
spectrum analysis, 531*A*.
IRON-TUNGSTEN ALLOYS, structure and composition, 516*A*.
IRON-TUNGSTEN SYSTEM, solidus temperature, 516*A*.
IRON-ZINC SYSTEM, 516*A*.

JAPAN, mineral industry, 324*A*.
JONES AND LAUGHLIN STEEL CORP., sheet grading machine, 412*A*.

KANTHAL, melting point, 517*A*.
KLÖNNE GASHOLDER, 352*A*.
KNOWLES COKING PROCESS, 346*A*.
KOBE STEEL WORKS, rolling mill plant, 403*A*.
KONAL, stability at high temperatures, 485*A*.
KRUPP, FRIED., A.G., steel plant, 390*A*.
KRUPP WELDING PROCESS, 435*A*.
KRYN AND LAHY, LTD., foundry plant, 374*A*.
KUGELFISCHER ROLLER BEARINGS, 402*A*.

LABORATORIES, equipment, 528*A*.
LANCASHIRE STEEL CORPORATION, LTD., plant, 389*A*.
LANCASTER PROCESS, 21*P*.
LEAD COATINGS, 448*A*.
LÉONARD EFFECT in iron castings, 375*A*.
LEY'S MALLEABLE CASTINGS CO., LTD., fettling plant, 373*A*.
LIME, effect on phosphorus distribution in steelmaking, 25*P*.
LINDE-FRÄNKL SYSTEM of producing oxygen, 357*A*.
LOOPING MILLS, calculation of loops, 404*A*.
LUBRICANTS, testing, 402*A*.
LUBRICATION:
rolling mills, 402*A*.
theory, 402*A*.

LÜDERS LINES :
75*P*.
carbon steel, 475*A*.
LUKENS STEEL CO., plant, 390*A*.
LUXEMBURG, blast-furnace practice, 354*A*.

MACHINABILITY, cast iron, 463*A*.
MACHINE CONSTRUCTION, use of cast iron, 467*A*.
MACHINE TOOLS :
use of alloy cast iron, 467*A*.
welding, 437*A*.
MACHINING, chromium-nickel steel, use of silver-steel tools, 481*A*.
MACKINTOSH-HEMPHILL CO., foundry plant, 369*A*.
MCLOUTH STEEL CORPORATION, rolling mill plant, 406*A*.
MCQUAID-EHN GRAIN-SIZE, relation to hot-work, 508*A*.
MAGNAFLUX METHOD for detecting defects, 475*A*.
MAGNESIA, effect on phosphorus distribution in steelmaking, 39*P*.
MAGNESITE BRICKS, *see* Refractory Bricks.
MAGNESIUM SILICATE, properties, 328*A*.
MAGNET STEEL :
cobalt, properties, 505*A*.
cobalt-molybdenum, properties, 505*A*.
cobalt-titanium, properties, 505*A*.
double-yoke tester, 503*A*.
nickel-aluminium, properties, 504*A*, 505*A*.
nickel-cobalt-aluminium, properties, 505*A*.
nickel-copper, properties, 505*A*.
tungsten, properties, 505*A*.
MAGNETIC AGEING, iron, effect of oxygen, 477*A*.
MAGNETIC METHOD for determining defects, 476*A*.
MAGNETIC PROPERTIES :
electrolytic iron sheets, 503*A*.
iron-nickel alloys, effect of structure, 503*A*.
iron-silicon alloys, 504*A*.
iron and steel, 503*A*.
MAGNETIC TRANSFORMATION, carbon steel, 513*A*.
MAGNETISATION, effect on ferromagnetic materials, modulus of elasticity, 471*A*.
MAGNETS :
electro, 390*A*.
permanent, materials for, 504*A*.
permanent, sintered materials for, 505*A*.

MALLEABLE CAST IRON :
effect of copper, 465*A*.
endurance limit, 468*A*.
heat treatment, 431*A*.
production, 373*A*.
welding, 439*A*.
MALLEABLE IRON FURNACES, refractory materials, 330*A*.
MANCHESTER MEETING :
proceedings, 1.
visits and excursions, 295.
MANGANESE :
action in steel making, 383*A*.
desulphurisation of steel, 384*A*.
determination in steel, 529*A*.
effect on case-hardened steel, 420*A*.
effect in cast iron, machinability, 463*A*.
effect in copper steel, corrosion, 525*A*.
effect in nickel steel, 99*P*.
effect on phosphorus distribution in steelmaking, 23*P*.
effect on steel wire, 415*A*.
MANGANESE CARBIDE, structure and composition, 508*A*.
MANGANESE STEEL :
austenite and martensite, 510*A*.
effect of degree of forging, 396*A*.
quenching, expansion due to martensitisation, 428*A*.
temper-brittleness, effect of phosphorus, 431*A*.
transformation, austenite, 512*A*.
use, crushing machines, 497*A*.
use, dredger-bucket chains, 499*A*.
use, mining practice, 497*A*.
MANGANOUS OXIDE, effect on phosphorus distribution in steelmaking, 38*P*.
MANGANOUS-OXIDE/ALUMINA SYSTEM, 387*A*.
MANIPULATORS for forgings, 395*A*.
MANNESMANN TUBE PROCESS, 408*A*, 409*A*.
MARINE ENGINE PARTS, fatigue, 491*A*.
MARTENS-HESSE EXTENSOMETER, 469*A*.
MARTENSITE :
in alloy steel, 510*A*.
transformation temperature, hardened steel, 513*A*.
MARTENSITE NEEDLES, median serration, 510*A*.
MEEHANITE CAST IRON :
endurance at low temperatures, 489*A*.
production, 374*A*.
MEGAPYR, melting point, 517*A*.
MELTING POINTS, electrical resistance alloys, 517*A*.
MEMBERS, election, 8.

MESOTHORIUM, irradiation of welds, 440*A*.
MICROSCOPIC EXAMINATION, preparation of specimens, 506*A*.
MID-DURHAM CARBONISATION CO., LTD., coking plant, 344*A*.
MILD STEEL :
behaviour under deformation at high temperatures, 179*P*.
behaviour under prolonged stress, 281, *Paper*.
MILLOM & ASKAM HEMATITE IRON CO., LTD., plant, 389*A*.
MINE-FILLING PIPES, steel for, 497*A*.
MINERAL RESOURCES, 322*A*.
MINING PRACTICE :
use of cast iron, 468*A*.
use of manganese steel, 497*A*.
MODULUS OF ELASTICITY, ferromagnetic substances, effect of magnetisation, 471*A*.
MOLYBDENUM :
diffusion of gases, 492*A*.
effect on ageing phenomenon, 476*A*.
effect in cast iron, impact resistance, 460*A*.
effect in cast iron, section susceptibility, 464*A*.
effect in copper steel, corrosion, 525*A*.
effect on steel wire, 415*A*.
separation from tungsten, 529*A*.
MOLYBDENUM HIGH-SPEED STEEL :
grain-size, effect of furnace atmosphere, 422*A*.
heat treatment, 427*A*.
properties, 494*A*.
MOLYBDENUM STEEL :
inclusions, 275*D*.
transformation, austenite, 512*A*.
MONARCH MACHINE TOOL CO., heat-treatment plant, 417*A*.
MONO-CAST CASTING PROCESS, 371*A*.
MONTANA, mineral resources, 323*A*.
MOTOR CAR ROOFS, pressing, 394*A*.
MOTOR FUEL, containers, 444*A*.
MOULDING, strickle, large castings, 370*A*.
MOULDING MACHINES, 365*A*.
MOULDING SAND :
determination of moisture, 367*A*.
grain-size distribution, 366*A*.
preparation, 367*A*.
properties, 366*A*.
MOULDS :
conveyors for, 365*A*.
drying, 366*A*.
gates and risers, 365*A*.
hand ramming, 365*A*.
rotating, use for cast iron, 363*A*.
NAPHTHALENE, determination in gas, 532*A*.
NATURAL GAS :
Burma, 322*A*.
Montana, 323*A*.
use in open hearth furnaces, 350*A*.
use in reheating furnaces, 350*A*.
use in soaking pits, 350*A*.
NEW BRUNSWICK, coal deposits, 322*A*.
NEWTON, CHAMBERS & CO., LTD., plant, 374*A*.
NICKEL :
cementation by tin, 419*A*.
diffusion of gases, 492*A*.
effect in cast iron, impact resistance, 460*A*.
effect in cast iron, section susceptibility, 464*A*.
effect in copper steel, corrosion, 525*A*.
effect on steel wire, 415*A*.
electrodeposition, 451*A*.
NICKEL ALLOYS :
determination of sulphur, 530*A*.
modulus of elasticity, effect of magnetisation, 471*A*.
use, automobile construction, 496*A*.
NICKEL-ALUMINIUM MAGNET STEEL, properties, 504*A*, 505*A*.
NICKEL CAST IRON :
thermal expansion, 462*A*.
use, automobile construction, 496*A*.
NICKEL-CHROMIUM ALLOYS, use for electric resistance, 517*A*.
NICKEL - CHROMIUM - MOLYBDENUM STEEL :
elastic limit, 471*A*.
penetration of molten white metals, 58*P*.
NICKEL-CHROMIUM STEEL :
elastic limit, 471*A*.
penetration of molten white metals, 55*P*.
properties, 472*A*.
NICKEL COATINGS, 448*A*.
NICKEL - COBALT - ALUMINIUM STEEL, properties, 505*A*.
NICKEL-COBALT-IRON ALLOYS, properties at high temperatures, 486*A*.
NICKEL-COPPER MAGNET STEEL, properties, 505*A*.
NICKEL-IRON ALLOYS :
drawing, 414*A*.
modulus of elasticity, effect of magnetisation, 471*A*.
NICKEL-MANGANESE STEEL, properties, 99, *Paper*.
NICKEL OXIDE, effect on reboiling in enamels, 457*A*.

NICKEL STEEL :
austenite and martensite, 510*A*.
effect of degree of forging, 396*A*.
impact resistance at low temperatures, 473*A*.
penetration of molten white metals, 50*P*.
properties 472*A*.
temper brittleness effect of phosphorus 431*A*.
transformation, austenite, 512*A*.
NILES SHEET MILL, plant, 405*A*.
NISSAN AUTOMOBILE CO., forge plant, 394*A*.
NITRIC ACID, potential of iron, 521*A*.
NITRIDED STEEL, hardness tests, 479*A*.
NITRIDING :
cast iron, 420*A*.
steel, 420*A*.
tool steel, 420*A*.
NITRIDING FURNACES, 418*A*.
NITROGEN :
action in steel making, 383*A*.
determination in coal, 532*A*.
determination in steel, 392*A*.
effect on ageing phenomenon, 476*A*.
effect in chromium steel, 519*A*.
effect in steel, ageing, 477*A*.
effect in steel, bibliography, 392*A*.
NOMENCLATURE, constituents in steel, 509*A*.
NORBIDE, 445*A*.
NORMALISING, sheets, 424*A*.
NOTCH FATIGUE STRENGTH, calculation from tensile strength and reduction of area, 488*A*.
NOTCH SENSITIVITY :
cast iron, 460*A*.
steel under alternating stress, 473*A*.
NOTCH TOUGHNESS, welds, 442*A*.
NOTCHES, stress concentration, 281*P*.

OBITUARY NOTICES, 311.
OIL, effect on wire, fatigue strength, 491*A*.
OIL REFINERIES :
behaviour of chromium-steel tubes, 478*A*.
corrosion of metals, 525*A*.
steels for, 498*A*.
OIL WELLS, selection of sucker-rods, 498*A*.
OOLITIC IRON ORE, in Dogger Sandstone, 323*A*.
OPEN-HEARTH FURNACES :
acid, small capacity, 372*A*.
control, 331*A*, 337*A*.
design and operation, 376*A*.
OPEN-HEARTH FURNACES (*contd.*)—
effect of raw materials charged, 378*A*.
heat balance, 378*A*.
insulation, 331*A*.
natural gas, 350*A*.
producer gas, 378*A*.
relation between port type, output and oxidising effect, 377*A*.
Terni type, 378*A*.
OPEN-HEARTH PRACTICE, waste-heat boilers, 336*A*.
OPEN-HEARTH PROCESS :
basic, reactions, 381*A*.
slag control, 385*A*.
OPEN-HEARTH SLAG, viscosity, 387*A*.
OPEN-HEARTH STEEL, residual metals present, 379*A*.
ORES, mining and treatment, 325*A*.
OTTO COKE-OVEN, 345*A*.
OVERSTRAINED MATERIAL stresses, 475*A*.
OVERSTRESSING, effect on metals, 487*A*.
OXALIC ACID, use, for etching, stainless steel, 506*A*.
OXFORD TESTING MACHINE, 472*A*.
OXIDATION :
frictional, steel, 481*A*.
iron and steel, 421*A*, 422*A*.
OXIDISING EFFECT, open-hearth furnaces, 377*A*.
OXYGEN :
corrosion of steel, 523*A*.
determination in steel, bibliography, 392*A*.
determination in steel, fusion method, 392*A*.
determination in steel, hot extraction and iodine solution methods, 392*A*.
effect in iron, magnetic ageing, 477*A*.
effect in iron-silicon alloys, magnetic properties, 504*A*.
effect in steel, ageing, 477*A*.
for enriching blast, 355*A*.
production, Linde-Fränkl system, 357*A*.
in steel, 392*A*.
OXYGEN-PHOSPHORUS EQUILIBRIUM in liquid iron, 358*A*.

PAINTS, heat-resistant, 458*A*.
PARK GATE IRON AND STEEL CO., LTD., waste-heat boiler trial, 336*A*.
PASOPAS DEVICE for measuring roll pressures, 399*A*.
PASSIVITY, metals, 521*A*.
PATTERNS, foundry, for pipes, 365*A*.

PERLITON CARBURISING COMPOUND, 419*A*.
PETROLEUM DEPOSITS, Montana, 323*A*.
PHOSPHORUS :
determination in steel, 529*A*.
distribution between metal and slag in basic process, 13, *Paper*.
effect in cast iron at high temperatures, 463*A*.
effect in cast iron, machinability, 463*A*.
effect in cast iron, section susceptibility, 464*A*.
effect in copper steel, corrosion, 517*A*.
effect in steel, temper-brittleness, 431*A*.
reactions in steelmaking, 13*P*.
PHOSPHORUS-OXYGEN EQUILIBRIUM in liquid iron, 358*A*.
PHOTO-ELASTIC TESTS, 474*A*.
PHOTOGRAPHY, metallographic, 507*A*.
PHOTOMICROGRAPHS, interpretation and preparation, 507*A*.
PICKLING :
Bullard-Dunn process, 446*A*.
electrolytic, 446*A*.
Ferrolite process, 447*A*.
hydrogen diffusion, 447*A*.
metals, 446*A*.
pitting of metals, 448*A*.
PICKLING BATHS :
use of inhibitors, 447*A*.
use of sodium cyanide, 447*A*.
PICKLING PLANT, lay-out, 446*A*.
PIG IRON :
desulphurisation, 384*A*.
production, 354*A*.
recovery of vanadium, 385*A*.
refined, production, 364*A*.
PIOBERT EFFECT in iron and steel, 75, *Paper*.
PIPES :
cast-iron, specification, British, 502*A*.
centrifugal casting, 370*A*.
corrosion tests, 522*A*.
mine-filling, steel for, 497*A*.
patterns for casting, 365*A*.
welding, 437*A*, 438*A*.
PISHEL TEST for cokability of coal, 343*A*.
PISTON CORES, centrifugal casting, 371*A*.
PISTON RINGS :
production, 369*A*.
single-cast compared with centrifugally-cast, 467*A*.
PLATES :
boiler, effect of cold-work, 482*A*.
roofing, cast iron, 370*A*.
PLATES (*contd.*)—
welded, compared to rolled material, 443*A*.
POKORNY BLOWER, 355*A*.
POLISHED SURFACES, nature, 507*A*.
POLISHING, metallographic, 507*A*.
POROSITY :
welds, 443*A*.
zinc coatings, 452*A*.
PORTS, open-hearth furnace, dimensions, 377*A*.
POWER, consumption in wire-drawing, 413*A*.
PRESET SCREWDOWN EQUIPMENT, 399*A*.
PRESSED STEEL CO., LTD., flash welding machine, 438*A*.
PRESSURE VESSELS :
alloy steel for, 500*A*.
welded, stress relief, 440*A*.
PRODUCER GAS, open-hearth furnaces, 378*A*.
PRODUCERS :
for coke-ovens, 350*A*.
reactions, 350*A*.
PROFILOGRAPH, for measuring surface roughness, 445*A*.
PROPANE :
combustion, 353*A*.
use for bright annealing, 423*A*.
PULLEY WHEELS, moulding, 369*A*.
PULVERISED COAL, *see* Coal, pulverised.
PUMPS, oil-refinery, steels for, 499*A*.
PYLONS, fracture, 502*A*.
PYROMETERS :
416*A*, 418*A*.
use in steel making, 337*A*.

QUENCHING, steel, expansion due to martensitisation, 428*A*.

RADIANT TUBES for furnace heating, 418*A*.
RAIL STEEL :
endurance at low temperatures, 489*A*.
manufacture, slag control, 385*A*.
RAILS :
Bessemer steel, properties, 501*A*.
heat treatment, 425*A*.
occurrence of fissures, 501*A*.
straightening machine, 412*A*.
RAPIDEEP CARBURISING COMPOUND, 419*A*.
REACTIVITY, coke, 349*A*.
RECUPERATORS, calculation, 338*A*.

REFRACTORY BRICK:
chrome, manufacture, Ritex process, 327A.
coke-oven doors, 329A.
firebrick, manufacture, 327A.
magnesite, properties, 328A.
silica, tridymite detection by X-rays, 328A.
REFRACTORY CEMENTS, properties, 327A.
REFRACTORY MATERIALS:
action of slags, 329A.
aluminous, properties, 327A.
fireclay, texture, 329A.
firing with coke-oven gas, 327A.
foundries, 329A.
grinding, dust elimination, 328A.
magnesia, properties, 327A.
magnesium silicate, properties, 328A.
malleable iron furnaces, 330A.
properties and tests, 327A.
siliceous, properties, 327A.
silico-aluminous, properties, 327A.
REGULATING INSTRUMENTS, 337A.
REHEATING FURNACES:
continuous, operation, 393A.
insulating bricks, 330A.
natural gas, 350A.
RIMMING STEEL, manufacture, slag control, 385A.
RISERS for moulds, 365A.
RISING SUN COLLIERY, coal-cleaning plant, 341A.
RITEX CHROME BRICK, 327A.
ROAD-MAKING MACHINERY, welding, 438A.
ROASTING:
iron ore, Saint Jacques furnace, 325A.
sulphide ores, 326A.
ROCK DRILLS, steels for, 499A.
ROCKINGHAM COLLIERY, coal-cleaning plant, 341A.
ROD MILLS:
403A, 407A.
calculation of loops, 404A.
ROLL COLLARS, use, 398A.
ROLL DESIGN, effect on seam formation in bars, 398A.
ROLL PRESSURES, measurement, Pasopas device, 399A.
ROLLED MATERIAL, thickness measurement, 412A.
ROLLING:
bright stock, 404A.
cold-, strip, effect of roll diameter, 407A.
flow of metals, roll opening phenomenon, 398A.
ROLLING MILL PLANT:
"B.M." Rolling Mills, Ltd., 406A.
Kobe Steel Works, 403A.
McLoutb Steel Corp., 406A.
Niles Sheet Mill, 405A.
Société Anonyme des Aciéries de Micheville, 403A.
South African Iron and Steel Corp., 404A.
Yniscedwyn Tinplate Co., Ltd., 410A.
Youngstown Sheet and Tube Co., 405A, 406A.
ROLLING-MILL PRACTICE, 398A.
ROLLING-MILL TABLES, individual driving, 410A.
ROLLING MILLS:
bar, 407A.
bar, running-out time of bars, 404A.
bearings, adjustment, 400A.
bearings, anti-friction, 400A.
bearings, effect of roll-neck deflection on life, 400A.
bearings, Kugelfischer type, 402A.
bearings, maintenance, 401A.
bearings, roller, 400A.
bearings, Schöpf type, 402A.
bearings, self-aligning, 400A.
bearings, S.K.F. type, 401A.
bearings, Timken type, 401A.
bearings, Vereinigte Kugellagerfabriken type, 401A.
billet, 403A.
blooming, 403A.
construction, 400A.
descaling of material, 411A.
electric driving, 410A.
lubrication, 402A.
precision, 407A.
rod, 403A, 407A.
rod, calculation of loops, 404A.
screw-down equipment, 399A.
section, 403A.
sheet, 404A, 405A.
sheet, American, 405A.
sheet, effect of metal composition on stickers, 406A.
sheet, output supervision, 405A.
Steckel, 406A.
strip, 405A, 406A, 407A.
strip, cost calculation, 408A.
tube, 408A.
tube, energy consumption in piercing billets, 409A.
tube, Russian, 410A.
ROLLS:
changing devices, 400A.
chilled, production, 368A, 369A.

ROLLS (*contd.*)—
chromium-molybdenum cast iron, failure, 368*A*.
composite, 398*A*.
diameter, effect on cold-rolling strip, 407*A*.
individual driving, 400*A*.
surface hardening, 369*A*.
ROOFING PLATES, cast iron, 370*A*.
ROSENBERG, iron ore deposits, 323*A*.
ROTARY ELECTRIC CO., heat-treatment plant, 423*A*.
ROUGHING MILLS, screw-down equipment, 399*A*.
R.R.-11 Alloy, 518*A*.
RUMANIA, metallurgical industry, 323*A*.
RUSSIA :
blast-furnace developments, 354*A*.
iron industry, electrification, 337*A*.
tube mills, 410*A*.

SAAR, metallurgical works, 360*A*.
SAAR COAL, constituents, 343*A*.
SAINT-JACQUES FURNACE, 325*A*.
SALT SOLUTIONS, corrosion of iron, 523*A*.
SAMPLING :
coal, 532*A*.
coal tar, 532*A*.
SARDINIA, mineral industry, 323*A*.
SCALING :
iron, 421*A*.
steel, subcutaneous effects, 67, *Paper*.
steel under stress, 524*A*.
SCHERBIUS CONTROL SYSTEM for blowers, 354*A*.
SCHÖPF ROLLER BEARINGS, 402*A*.
SCOTLAND, shale oil industry, 352*A*.
SCREENING, coke, 413*A*.
SCREW-DOWN EQUIPMENT, rolling mills, 399*A*.
SECTION MILLS, 403*A*.
SEGREGATION :
effect of differential solidification, 392*A*.
relation to gas formation in steel, 392*A*.
SELENIUM STEEL, 495*A*.
SESCI FURNACES, 363*A*.
SHAFTS, bend-fatigue strength, effect of fillets, 490*A*.
SHALE OIL INDUSTRY, Scotland, 352*A*.
SHAPE, effect on strength, 469*A*.
SHEEPBRIDGE STOKES CENTRIFUGAL CASTINGS CO., LTD., plant, 373*A*.
SHEET BAR MILL, screw down equipment, 399*A*.
SHEET MILLS :
404*A*, 405*A*.
American, 405*A*.
effect of metal composition on stickers, 406*A*.
output supervision, 405*A*.
SHEETS :
blanking and shearing, 413*A*.
corrosion, 524*A*.
deep-drawing tests, effect of tool dimension, 397*A*.
electrolytic iron, magnetic properties, 503*A*.
enamelling, 456*A*.
grading machine, 412*A*.
handling truck, 413*A*.
heat-treatment furnaces, 417*A*.
measuring device, 412*A*.
normalising, 424*A*.
pickling, hydrogen diffusion, 447*A*.
thermal conductivity, 482*A*.
welding, 438*A*.
SHIP CONSTRUCTION :
electric arc welding, 440*A*.
steels for, 495*A*.
SHORTERISING PROCESS, 420*A*.
SIEGERLAND, iron ore deposits, formation, 323*A*.
SILICA, effect on phosphorus distribution in steelmaking, 25*P*.
SILICA BRICKS, *see* Refractory Bricks.
SILICATES, iron-nickel, equilibria with iron-nickel alloys, 381*A*.
SILICO-MANGANESE STEEL, tempering, effect of deformation, 429*A*.
SILICON :
effect in cast iron, machinability, 463*A*.
effect in cast iron, section susceptibility, 464*A*.
effect in copper steel, corrosion, 525*A*.
effect in steel, corrosion, 525*A*.
effect on steel wire, 415*A*.
transformation, austenite, 512*A*.
SILICON - CHROMIUM - MOLYBDENUM STEEL, properties at high temperatures, effect of carbon, 486*A*.
SILKSWORTH COLLIERY, coal-cleaning plant, 341*A*.
SILVER-STEEL TOOLS, use for machining chromium-nickel steel, 481*A*.
SIMPLEX BLAST-FURNACE STOVE, 355*A*.
SIMPLEX GAS CLEANING SYSTEM, 351*A*.
SINTER, reducibility, 358*A*.
SINTERED MATERIALS for permanent magnets, 505*A*.

SINTERING :
iron ore, Dwight-Lloyd system, 326*A*.
iron ore, Saint Jacques furnace, 325*A*.
SINUFLO FIRE-TUBES, 337*A*.
S.K.F. ROLLER BEARINGS, 401*A*.
SLAG CARS, 413*A*.
SLAG-METAL EQUILIBRIA, 383*A*.
SLAG REACTIONS, acid, action of carbon as reducing agent, 382*A*.
SLAG REDUCTION CO., LTD., plant, 388*A*.
SLAG SYSTEMS, 387*A*.
SLAGS :
action on refractory materials, 329*A*.
blast-furnace, desulphurising action, effect of alumina, 357*A*.
control in basic electric-furnace practice, 385*A*.
control in blast-furnaces, 384*A*.
control in steel making, 385*A*.
testing, 385*A*.
viscosity, 387*A*.
SLURRY, treatment, 341*A*.
SMITH ALLOY No. 10, 518*A*.
SOAKING PITS :
construction and operation, 393*A*.
heating of ingots, 393*A*.
natural gas, 350*A*.
SOCIÉTÉ ANONYME DES ACIÉRIES DE MICHEVILLE, rolling mill plant, 403*A*.
SOCIÉTÉ MÉTALLURGIQUE DE MONTBARD-AULNOYE, seamless-tube plant, 409*A*.
SOCIÉTÉ MINIÈRE DES TERRES ROUGES, blowing plant, 355*A*.
SODA ASH, use for refining cast iron, 363*A*.
SODIUM CYANIDE, use in pickling baths, 447*A*.
SODIUM SULPHITE, effect on tinplate, corrosion, 454*A*.
SOFTENING TEMPERATURE, coal ash, determination, 333*A*.
SOIL RESISTANCE, relation between underground currents, 527*A*.
SOLDER, penetration into steel, 43*P*.
SOLIDIFICATION, differential, effect on segregation in ingots, 392*A*.
SOPHIA-JACOBA COLLIERY, coal-cleaning plant, 340*A*.
SOUTH AFRICAN IRON AND STEEL CORP. :
blast-furnace plant, 354*A*.
plant, 390*A*.
rolling-mill plant, 404*A*.
SPARK TESTS, 492*A*.
SPATHIC ORE, Siegerland, formation, 323*A*.
SPECIFICATION :
cast-iron pipes, British, 502*A*.
grinding wheels, British, 503*A*.
weld metal for oxy-acetylene welding, 434*A*.
wire ropes, British, 503*A*.
SPECTRUM ANALYSIS :
530*A*, 531*A*.
iron-nickel alloys, 531*A*.
SPEED CASE STEEL, 494*A*.
SPEEDICASE CARBURISING COMPOUND, 419*A*.
SPONGINESS in iron castings, 375*A*.
SPRAYING, metals, 448*A*, 455*A*.
SPRINGS :
heat treatment, 417*A*, 425*A*.
testing machine, 469*A*.
STAINLESS STEEL :
determination of chromium, 529*A*.
drawing, 415*A*.
etching reagent, use of oxalic acid, 506*A*.
forging, 395*A*.
welding, 435*A*.
STAMPINGS, estimation of blanks, 397*A*.
STECKEL MILLS, 406*A*.
STEEL :
ageing, 476*A*.
ageing, effect of deoxidation, 477*A*.
ageing, effect of nitrogen and oxygen, 477*A*.
alloy, case-hardening, 420*A*.
alloy, drawing, 415*A*.
alloy, properties, 506*A*.
alloy, transformation, effect of elements, 512*A*.
alloy, use, aircraft construction, 495*A*.
alloy, welding, 436*A*.
analysis, 529*A*.
behaviour under prolonged stress, 281, *Paper*.
bleeding, 480*A*.
boiler, caustic embrittlement, 478*A*.
bright, 495*A*.
case-hardened, effect of manganese, 420*A*.
case-hardening, 419*A*.
cementation by beryllium, 418*A*.
cold-drawn, endurance at low temperatures, 489*A*.
corrosion, effect of elements, 525*A*.
corrosion in oxygen and carbon dioxide solutions, 523*A*.
corrosion probability, effect of composition, 520*A*.
creep, effect of time, 484*A*.
creep, structural changes taking place, 179*P*.
damping capacity, 487*A*.

STEEL (*contd.*)—
decarburisation, effect of grain-size, 423*A*.
deoxidation, 383*A*.
desulphurisation, 383*A*.
desulphurisation by beryllium, 384*A*.
desulphurisation by manganese, 384*A*
direct production in blast-furnace, 360*A*.
elastic properties, 470*A*.
fatigue tests, load deflection, 488*A*.
ferrite formation, effect of deoxidation, 509*A*.
free-cutting, 494*A*, 495*A*.
frictional oxidation, 481*A*.
gases in, 383*A*, 392*A*.
grain-size, effect of aluminium, 493*A*.
grain-size, relation to hot-work, 508*A*.
hardened, transformation temperatures of austenite and martensite, 513*A*.
hardening, 426*A*.
high-tensile, properties, 494*A*.
high-tensile, welding, 434*A*.
inclusions, 392*A*.
liquid, temperature measurement, 379*A*.
manufacture, 376*A*.
manufacture, acid-slag reactions, action of carbon, 382*A*.
manufacture, behaviour of elements, 383*A*.
manufacture, slag control, 385*A*.
microscopic constituents, 509*A*.
microscopic constituents, nomenclature, 509*A*.
nitriding, 420*A*.
notch sensitiveness under alternating stress, 473*A*.
open-hearth, residual metals present, 379*A*.
oxygen content, 392*A*.
penetration of molten white metals, 43, *Paper*.
Piobert effect, 75, *Paper*.
properties at high temperatures, 483*A*, 484*A*.
properties at high temperatures, effect of carbon, 486*A*.
quenching, expansion due to martensitisation, 428*A*.
rail, endurance at low temperatures, 489*A*.
scaling, 421*A*.
scaling, subcutaneous effects, 67, *Paper*.
stability at high temperatures, 485*A*.
stress-elongation curves in blue-heat range, 482*A*.

STEEL (*contd.*)—
temper-brittleness, 431*A*.
temper-brittleness, effect of phosphorus, 431*A*.
tempering, 426*A*.
tensile strength, 470*A*.
transformations, 511*A*.
welding, 434*A*.
STEEL, PEECH AND TOZER, plant, 389*A*.
STEEL PLANTS :
Hadfields, Ltd., 390*A*.
Fried. Krupp. A.G., 390*A*.
Lancashire Steel Corporation, Ltd., 389*A*.
Lukens Steel Co., 390*A*.
Millom and Askam Hematite Iron Co., Ltd., 389*A*.
South African Iron and Steel Corp., 390*A*.
United Steel Companies, Ltd., 388*A*, 389*A*.
Vereinigte Oberschlesische Hüttenwerke A.G., 390*A*.
STERLING FOUNDRY CO., foundry plant, 375*A*.
STILL COKE-OVEN, 344*A*.
STRAIGHTENING MACHINE for rails, 412*A*.
STRAIN FIGURES :
75*P*.
carbon steel, 475*A*.
STRENGTH, effect of shape, 469*A*.
STRESS :
alternating, notch-sensitiveness of steel, 473*A*.
concentration at holes and notches, 281*P*.
prolonged, behaviour of mild steel, 281, *Paper*.
STRESS-ELONGATION CURVES, steel, in blue-heat range, 482*A*.
STRESS RELIEF, pressure vessels, 440*A*.
STRESSES :
overstrained material, 475*A*.
in welds, measurement, 441*A*.
STRIP :
annealing, 423*A*.
coating with copper-lead, 454*A*.
cold-rolling, effect of roll diameter, 407*A*.
conveyors, 413*A*.
defects, 408*A*.
STRIP MILLS :
405*A*, 406*A*, 407*A*.
cost calculation, 408*A*.
STRUCTURAL STEEL :
corrosion under stress, 524*A*.
cutting, 444*A*.
effect of degree of forging, 396*A*.
elastic limit, 470*A*.

SUCKER-RODS, selection for oil wells, 498*A*.
SULPHIDE ORES, roasting, 326*A*.
SULPHUR :
behaviour in steel making, 383*A*.
determination in nickel alloys, 530*A*.
determination in steel, 530*A*.
effect in cast iron, machinability, 463*A*.
SULPHURIC ACID, corrosion of iron, effect of arsenic, 525*A*.
SULPHURIC-ACID/AMMONIUM-SULPHATE /WATER SYSTEM, 348*A*.
SUNCOLE CARBONISATION PROCESS, 347*A*.
SUPERHEATERS, alloy steel for, 500*A*.
SUPERHEATING, effect on cast iron, 463*A*, 464*A*.
SURFACE ROUGHNESS, measurement, 445*A*.
SWEDISH IRON, behaviour under deformation at high temperatures, 179*P*.

TANKS, asphalt coating, 458*A*.
TAR :
hydrogenation, 352*A*.
steelworks, characteristics, 379*A*.
TAR-MACADAM, production, 388*A*.
TECHNICAL TERMS, definitions, 506*A*.
TEMPER-BRITTLENESS :
effect on penetration of white metals into steel, 62*P*.
nickel-manganese steel, 111*P*.
steel, 431*A*.
steel, effect of phosphorus, 431*A*.
TEMPERATURES :
casting, effect on blowholes in ingots, 392*A*.
control, 337*A*.
fusion, coal ash, determination, 333*A*.
high, deformation of metals, 179, *Paper*.
high, properties of cast iron, 461*A*.
high, properties of nickel-cobalt-iron alloys, 486*A*.
high, properties of steel, 483*A*, 484*A*.
high, properties of steel, effect of carbon, 486*A*.
high, stability of steel, 485*A*.
high, tensile testing machine, 185*P*.
high, tensile tests of iron and steel, 179*P*.
low, fatigue tests of metals, 489*A*.
low, impact resistance of nickel steel, 473*A*.
measurement, 416*A*.
TEMPERATURES (*contd.*)—
measurement, errors with thermo-elements, 417*A*.
measurement, liquid steel, 379*A*.
pouring, effect on cast iron, 464*A*.
softening, coal ash, determination, 333*A*.
TEMPERING :
iron-nickel-chromium alloys, effect of tension, 430*A*.
roller bearings, 417*A*, 428*A*.
silico-manganese steel, effect of deformation, 429*A*.
steel, 426*A*.
TENSILE PROPERTIES, nickel-manganese steel, 99*P*.
TENSILE STRENGTH :
cast iron, relation to transverse strength, 459*A*.
steel, 470*A*.
TENSILE TESTING MACHINE for high temperatures, 185*P*.
TENSILE TESTS :
iron and steel at high temperatures, structural changes taking place, 179*P*.
steel, in blue-heat range, 482*A*.
welds, 441*A*.
TERNI OPEN-HEARTH FURNACES, 378*A*.
TEST BARS :
cast iron, 459*A*.
notched, standardisation, 472*A*.
TESTING MACHINES, 468*A*.
for cast iron, 459*A*.
creep, 184*P*.
fatigue, electromagnetic, 487*A*.
fatigue, Haigh-Robertson, 487*A*.
fatigue, rotating-beam, 487*A*.
fatigue, for small-diameter wire, 486*A*
hardness, Ballentine, 479*A*.
impact, Oxford, 472*A*.
springs, 469*A*.
tensile, for high temperatures, 185*P*.
TESTS :
bend, cast iron, 460*A*.
corrosion, methods, 522*A*.
corrosion, pipes, 522*A*.
creep, Rohn method, 484*A*.
cutting, tool steel, 481*A*.
deep-drawing, sheets, effect of tool dimension, 397*A*.
electrodeposited metals, 451*A*.
electromagnetic, wire ropes, 482*A*.
fatigue, load-deflection, 488*A*.
fatigue, metals at low temperatures, 489*A*.
fatigue, welds, 441*A*, 442*A*.
folding, welds, 441*A*.
forge, welds, 441*A*.

TESTS (*contd.*)
hardness, nitrided steel, 479*A*.
impact, welds, 441*A*.
photo-elastic, 474*A*.
spark, 492*A*.
tensile, steel, in blue-heat range, 482*A*.
tensile, welds, 441*A*.
wear, 479*A*, 480*A*.
welded tubes, 441*A*.
welds, 441*A*, 442*A*.
wire, 468*A*.
THERMOCOUPLES, errors in use, 417*A*.
THERMOTECHNOLOGICAL CALCULATIONS, 334*A*.
TILLMANN FLUES for coke-ovens, 344*A*.
TILMANSTONE BRIQUETTE PLANT, 343*A*.
TIMKEN ROLLER BEARING CO., heat-treatment furnaces, 418*A*.
TIMKEN ROLLER BEARINGS, 401*A*.
TIN :
cementation of iron, copper and nickel, 419*A*.
effect in copper steel, corrosion, 517*A*.
electrodeposition, use of alkaline stannate baths, 450*A*.
TIN ALLOYS, equilibrium diagram, 516*A*.
TIN COATINGS :
448*A*.
electrodeposited, superimposed on tin, 453*A*.
hot-dipped, 453*A*.
TIN DEPOSITS, France, 322*A*.
TINPLATE :
corrosion, effect of sodium sulphite, 454*A*.
formation of black spots, 453*A*.
improvement by superimposed electrodeposited tin, 453*A*.
optical metal of surface examination, 135, *Paper*.
TITANIFEROUS IRON ORE, concentration, 325*A*.
TITANIUM :
determination in chromium steel, 530*A*.
effect in cast iron, impact resistance, 460*A*.
effect in copper steel, corrosion, 525*A*.
use in metallurgy, 493*A*.
TOOL STEEL :
cutting tests, 481*A*.
decarburisation, 423*A*.
hardening, 426*A*.
hardening characteristics, 508*A*.
hardening depth, determination, 426*A*.
heat treatment, 417*A*, 427*A*.
nitriding, 420*A*.
torsion-impact properties, 474*A*.
TORSION-IMPACT PROPERTIES, tool steel, 474*A*.
TOUGHNESS, notch, welds, 442*A*.
TRANSFORMATION :
alpha-gamma, 511*A*, 512*A*.
austenite, alloy steel, 512*A*.
austenite, initiatory period, 513*A*.
iron, heat evolution, 511*A*.
iron-manganese alloys, 514*A*.
magnetic and austenite, carbon steel, 513*A*.
steel, 511*A*.
TRANSFORMATION TEMPERATURES, austenite and martensite in hardened steel, 513*A*.
TRANSVERSE STRENGTH, cast iron, relation to tensile strength, 459*A*.
TUBE DRAWING, flow of material, 119*P*.
TUBE MILLS :
408*A*.
energy consumption in piercing billets, 409*A*.
Russian, 410*A*.
TUBES :
chromium-molybdenum steel, manufacture, 408*A*.
heat-treatment furnaces, 417*A*.
seamless, manufacture, Erhardt process, 409*A*.
seamless, manufacture, extrusion process, 409*A*.
seamless, manufacture, Foren process, 408*A*.
seamless, manufacture, Mannesmann process, 408*A*, 409*A*.
seamless, manufacture, push-bench process, 409*A*.
welded, tests, 441*A*.
TUNGSTEN :
effect in cast iron, section susceptibility, 464*A*.
effect in copper steel, corrosion, 525*A*.
effect on steel wire, 415*A*.
TUNGSTEN-COBALT-IRON ALLOYS, stability at high temperatures, 485*A*.
TUNGSTEN DEPOSITS, France, 322*A*.
TUNGSTEN MAGNET STEEL, properties, 505*A*.
TUNGSTEN STEEL :
quenching, expansion due to martensitisation, 428*A*.
transformation, austenite, 512*A*.
TURBINES :
cavitation, 527*A*.
Zoelly type, 355*A*.

UNIFLOC REAGENT, for slurry treatment, 341*A*.

UNITED KINGDOM :
specification for cast iron pipes, 502*A*.
specification for grinding wheels, 503*A*.
specification for wire ropes, 503*A*.
UNITED STATES :
coal cleaning, 339*A*.
mineral resources, 323*A*.
sheet mill practice, 405*A*.
welding technique, 433*A*.
UNITED STEEL COMPANIES, LTD. :
Appleby plant, 388*A*.
Samuel Fox and Co's plant, 389*A*.
Templeborough plant, 389*A*.
Workington plant, 388*A*.
USICAST, 370*A*.

VANADIUM, recovery from pig iron, 385*A*.
VANADIUM STEEL, transformation, austenite, 512*A*.
VANADIUM-TITANIUM CAST IRON, 364*A*.
VEREINIGTE KUGELLAGERFABRIKEN A. G., roller bearings, 401*A*.
VEREINIGTE OBERSCHLESISCHE HÜTTENWERKE, A.G., steel plant, 390*A*.
VISCOSITY, slags, 387*A*.

WASH OIL :
regeneration, 349*A*.
thickening, 348*A*.
WASHING, coal, Hoyois washer, 341*A*.
WASTE HEAT, recovery, bibliography, 336*A*.
WASTE-HEAT BOILERS :
gas works practice, 336*A*.
open-hearth practice, 336*A*.
WEAR :
cast iron, 462*A*.
wire-drawing dies, 413*A*.
WEAR TESTS, 479*A*, 480*A*.
WELD METAL :
austenitic, structure, 436*A*.
specification for oxy-acetylene welding, 434*A*.
WELDED PLATES, compared to rolled material, 443*A*.
WELDED SPECIMENS, residual stress, effect under tension, 475*A*.
WELDING :
alloy steel, 434*A*, 436*A*.
austenitic, Krupp process, 435*A*.
bronze overlays to steel, 437*A*.
electric, 433*A*, 439*A*.
electric, power for, 432*A*.
electric arc, ship construction, 440*A*.
WELDING (*contd.*)—
electric arc, types of electrodes, 433*A*.
electric resistance, 433*A*.
engine seating structures, 437*A*.
fractured parts, 443*A*.
high-tensile steel, 434*A*.
machine tools, 437*A*.
malleable cast iron, 439*A*.
oxy-acetylene, 433*A*.
oxy-acetylene, specification for weld metal, 434*A*.
pipes, 437*A*, 438*A*.
road-making machinery, 438*A*.
seam, electric resistance, 432*A*.
sheets, 438*A*.
stainless steel, 435*A*.
steel castings, 440*A*.
WELDING MACHINES :
electric resistance, 432*A*.
flash, automobile parts, 438*A*.
spot, electrodes for, 432*A*.
spot, valve control, 432*A*.
WELDON TOOL CO., heat-treatment plant, 417*A*.
WELDS :
contraction, 443*A*.
corrosion, 526*A*.
crack formation, 443*A*.
effect of peening, 440*A*.
fatigue tests, 441*A*, 442*A*.
folding tests, 441*A*.
forge tests, 441*A*.
hardness distribution, 442*A*.
impact tests, 441*A*.
irradiation with mesothorium, 440*A*.
notch toughness, 442*A*.
porosity, 443*A*.
stress measurement, 441*A*.
tensile tests, 441*A*.
WHITE METALS, molten, penetration into steel, 43, *Paper*.
WINGET, LTD., foundry plant, 374*A*.
WIRE :
cold-drawn, fatigue, effect of low-temperature heat treatment, 143, *Paper*.
fatigue, effect of oils and greases, 491*A*.
small-diameter, fatigue testing machine, 486*A*.
stainless steel, drawing, 415*A*.
steel, effect of elements, 415*A*.
tests, 468*A*.
yield under stresses of small duration, 490*A*.
WIRE-DRAWING :
flow of material, 120*P*.
power consumption, 413*A*.
WIRE-DRAWING DIES, wear, 413*A*.

WIRE-DRAWING PLANTS, layout and maintenance, 415*A*.
WIRE ROPES :
deterioration in service, 498*A*.
electromagnetic tests, 482*A*.
properties, 497*A*.
specification, British, 503*A*.
WIRE SHAPES, drawing, 414*A*.
WROUGHT IRON :
manufacture, Aston process, 359*A*.
manufacture and properties, 359*A*.

X-RAY EXAMINATION :
coal, 338*A*.
metals, 507*A*.
silica brick, 328*A*.
steel castings, 440*A*.

YNISCEDWYN TINPLATE CO., LTD., rolling mill plant, 410*A*.
YOUNGSTOWN SHEET AND TUBE CO., rolling mill plant, 405*A*, 406*A*.
YUGOSLAVIA, chrome ore deposits, 323*A*

ZINC AMMONIUM CHLORIDE, use in galvanising, 451*A*.
ZINC COATINGS :
448*A*.
immersion time *versus* quality, 452*A*.
porosity, 452*A*.
ZINC-IRON SYSTEM, 516*A*.
ZIRCONIUM :
determination in chromium steel, 530*A*.
uses, 493*A*.
ZOELLY TURBINE, 355*A*.

NAME INDEX.

ABBOTT, E. J., measurement of surface finish, 445*A*.
ACKLEY, R. A., alpha-gamma transformation, 512*A*.
ANDREW, J. H.:
inclusions in ingots, 392*A*.
segregation in ingots, 392*A*.
steel castings, 371*A*.
steel melted *in vacuo*, 392*A*.
ANDRIEU, O., sticking of sheets, 406*A*.
AKIMOW, G. W., corrosion with oxygen depolarisation, 521*A*.
ALBERT, W., elected member, 8.
ALBRECHT, R., measurement of rolled materials, 412*A*.
ALCACER, J. N., strength of cast iron, 461*A*.
ALEXANDER, M., effect of casting temperature on blowholes in ingots, 392*A*.
ALLEN, R. H., de-dusting of coal, 340*A*.
ALMEN, J. O., endurance of axle gears, 492*A*.
APPENRODT, A., damping capacity of steel, 488*A*.
APPLEYARD, K. C., coal-cleaning at Rising Sun Colliery. 341*A*.
ARMOUR, J. D., cold-drawn bars, 397*A*.
ARMSTRONG, T. N., welding of steel, 434*A*.
ARNFELT, H., iron-tungsten and iron-molybdenum alloys, 516*A*.
ARONOVITCH, V., drying of moulds, 366*A*.
ARVIDSSON, E. D., welding, 434*A*.
ASH, E. J., X-ray examination of castings, 440*A*.
ASHDOWN, H. H., cracks in forgings, 396*A*.
ASTON, J., wrought iron, 359*A*.
ATKINS, E. A.:
patented steel wire, 169*D*.
use of Hele-Shaw apparatus, 130*D*.
AUSTIN, C. R., properties of nickel cobalt-iron alloys at high temperatures, 486*A*.

BAATZ, K., notch-toughness of boiler welds, 441*A*.
BABLIK, H., diffusion of hydrogen in pickling, 447*A*.
BACON, F., fatigue of marine engine parts, 490*A*.
BACON, N. H., forging steel, 395*A*.
BADENHEUER, F., high-frequency furnaces, 386*A*.
BAEYERTZ, M., oxidation of steel, 422*A*.
BAIN, E. C.:
ageing of steel, 476*A*.
constituents in steel, 509*A*.
BALES, C. E., firing of refractories, 327*A*.
BALLAY, M., elected member, 8.
BALLENGER, W. M., screw-down control gear, 399*A*.
BANNISTER, L. C., tests of electrodeposited coatings, 451*A*.
BARBER, C. T., natural gas in Burma, 322*A*.
BARDENHEUER, P.:
equilibria between iron-nickel alloys and iron-nickel silicates, 381*A*.
reactions in basic process, 381*A*.
BARKER, G. H., pyrometers, 416*A*.
BARRETT, E. P., coal-ash softening temperature, 333*A*.
BATTY, G. A., temperature gradients in steel casting, 371*A*.
BAUER, J., electrodeposition of copper-nickel-iron alloys, 449*A*.
BAUKLOH, W., effect of hydrogen in cast iron, 466*A*.
BAUTZ, W., strength due to shape, 469*A*.
BAX, K., mine-filling blast pipes, 497*A*.
BAYLE, R. M., screw-down control gear, 399*A*.
BECK, K., enamels, 457*A*.
BECKMANN, E., Krupp welding process, 435*A*.
BEENY, H. H., machinability of cast iron, 463*A*.
BELCHER, R., estimation of fusain in coal, 339*A*.
BELL, R. A., slagging of refractories, 329*A*.
BENBOW, W. E., elected member, 8.
BENNEK, H., effect of phosphorus on temper-brittleness, 431*A*.
BENSON, L. E.:
inclusions in steel, 275*D*.
stressed metals at high temperatures, 228*D*.

BERESFORD-JONES, P., elected member, 8.
BERRISFORD, S. R., de-dusting of coal, 340*A*.
BERTSCHINGER, R., properties of cast iron at high temperatures, 461*A*.
BERTHELOT, C.:
coal cleaning, 340*A*.
metal industries of Rumania and Czechoslovakia, 323*A*.
metal industries of Sardinia, 323*A*.
BERTHOLD, R.:
irradiation of welds with meso-thorium, 440*A*.
tests of welds, 441*A*.
BIERETT, G., measurement of weld stresses, 441*A*.
BIRCH, R. E., Forsterite refractories, 328*A*.
BIRÜKOFF, N. D., electrodeposition of chromium, 451*A*.
BISCHOF, temper-brittleness, 431*A*.
BISCHOF, F., effect of phosphorus in cast iron, 466*A*.
BISCHOF, W.:
Paper on "The Distribution of Phosphorus between Metal and Slag in the Basic Process of Steel Manufacture." *See* Maurer, E.
BLAUROCK, F., temperature measurement of molten iron, 379*A*.
BOCEK, H., chilled castings, 368*A*.
BOEGEHOLD, A. L., endurance of axle gears, 492*A*.
BOLLENRATH, F., tempering of silico-manganese steel, 429*A*.
BOLSOVER, G. R.:
inclusions in steel, 392*A*.
ingot moulds, 391*A*.
BOLTON, J. W., properties of cast iron, 460*A*.
BONDY, J. A. DE, steel castings in mining operations, 497*A*.
BONHOMME, W., desulphurisation of iron, 384*A*.
BONNOT, M., corrosion of welds, 526*A*.
BONZEL, M., heat-treatment of cold-worked materials, 429*A*.
BOON, W. L., preparation and marketing of coke, 349*A*.
BOONE, W. D., fatigue tests at low temperatures, 489*A*.
BOREL, temper-brittleness, 431*A*.
BORNSTEIN, H., heat treatment of malleable cast iron, 431*A*.
BOSTON, W., cutting tests, 481*A*.
BOUSSARD, F.:
cupolas and pulverised-fuel-fired furnaces, 362*A*.
hand ramming of sand, 365*A*.
BOUTIGNY, M., electric arc furnaces, 372*A*.
BOWER, R. S., open-hearth furnaces, 376*A*.
BOWERS, C. N., selection of sucker-rods, 498*A*.
BOWLES, H. J., electric welding, 433*A*.
BOYLSTON, H. M., age-hardening of metals, 476*A*.
BRADSHAW, W. N., electrodeposited tin coatings, 453*A*.
BRAMLEY, A., obituary notice, 311.
BRAUNS, E., equilibria between iron-nickel alloys and iron-nickel silicates, 381*A*.
BREDDIN, H., Siegerland spathic ore, 323*A*.
BRENNERT, S., black spots on tinned wares, 453*A*.
BRIGGS, C. W., contraction of steel castings, 375*A*.
BRING, G. G., concentration of titaniferous iron ore, 325*A*.
BRINKMAN, I. A., moulding practice, 367*A*.
BROOME, L. R., elected member, 8.
BROPHY, G. R., damping capacity, 487*A*.
BROWN, R. S., heat-resistant steel, 519*A*.
BROWNLIE, D.:
control of boilers, 336*A*.
low-temperature carbonisation, 346*A*.
BRÜCHE, E. α-γ transformation, 511*A*.
BRUNNER, T., heat treatment of rails, 425*A*.
BRUTON, G. L., pickling of sheet iron, 447*A*.
BUCHHOLTZ, H., corrosion and scaling of structural steel, 524*A*.
BÜCHLER, F., gas analysis apparatus, 532*A*.
BUCHWALD, A., "factor of elasticity" of bridge girders, 492*A*.
BUCKWALTER, T. V., photo-elastic tests, 474*A*.
BUELL, W. C., jun.:
insulation of open-hearth furnaces, 331*A*.
open-hearth furnaces, 376*A*.
BÜLTMANN, moulding sand, 366*A*.
BURGERS, W. G., textures of nickel-iron alloys, 503*A*.
BURN, W. S., fatigue of marine engine parts, 490*A*.

BURR, W. H., sheet-mill practice, 405*A*.
BURRELL, B. S., lubrication, 402*A*.
BUTLER, G. B., blast-furnace practice, 354*A*.
BUZON, V., elected member, 8

CALDWELL, G. A., general purpose motors, 411*A*.
CAMERON, D. D., moulding sand, 367*A*.
CAMP, E., corrosion tests, 525*A*.
CAMPBELL, D. A., impact resistance of nickel steel, 473*A*.
CAMPBELL, H. L., cupola charges, 362*A*.
CANFIELD, J. J., enamels, 457*A*.
CARIUS, C., austenitic welding, 436*A*.
CASTRO, R.:
  Paper on "Morphology of the Inclusions in Siderurgical Products." *See* Portevin, A. M.
CASWELL, J. S.:
  production of blackplate, 405*A*.
  roll failures, 368*A*.
CAULLE, A., manganese steel for dredgers, 493*A*.
CAYFORD, J. M., enamels, 457*A*.
CHALLANSONNET, J.:
  piston rings, 369*A*.
  vanadium cast iron, 364*A*.
CHALMERS, B.:
  Paper on "Examination of the Surface of Tinplate by an Optical Method." *See* Hoare, W. E.
  optical examination of tinplate, 454*A*.
CHAMEN, L. H., elected member, 8.
CHAUDRON, G., gases in metals, 532*A*.
CHEVENARD, P.:
  tempering of iron-nickel-chromium alloys, 430*A*.
  tests of metals at high temperatures, 484*A*.
CHIANG, T. K., elected member, 8.
CHIPMAN, J., reaction of hydrogen with ferrous oxides, 380*A*.
CHRISTIAN, W. T., firing of refractories, 327*A*.
CLARK, C. L.:
  creep of steel, 484*A*.
  properties of steel at high temperatures, 485*A*.
CLARK, H. B., corrosion with oxygen depolarisation, 521*A*.
CLARKE, B. L., determination of sulphur, 530*A*.
CLASEN, A., heat treatment of tool steel, 427*A*.
COOK, E.:
  control of open-hearth furnaces, 337*A*.
  fissures in rails, 501*A*.
COOK, F. J., balanced-blast cupolas, 362*A*.
COREY, R. C., corrosion of steel, 523*A*.
CORNELIUS, H., ageing of steel, 478*A*.
COSTE, P., reactions in producers, 350*A*.
COTEL, E., hardness distribution in welds, 442*A*.
COTTON, A., temperature measurement, 416*A*.
COUTANT, J. G., insulation of furnaces, 331*A*.
CRAMER, H.:
  composite rolls, 398*A*.
  effect of roll design on formation of seams in bars, 398*A*
CRAWFORD, J. T., coal flotation, 339*A*.
CRAWSHAW, S. L., gearing for cranes, 390*A*.
CRICHETT, J. H., oxy-acetylene welding, 433*A*.
CROSKELL, A. C., control of welding machines, 432*A*.
CULBERT, R. C. A., corrosion of iron, 523*A*.
CUTHBERTSON, J. W., load-deflection fatigue tests, 488*A*.
CZOCHRALSKI, J., elected member, 8.

DAEVES, K.:
  corrosion-resistant steel, 517*A*.
  definition of technical terms, 506*A*.
  tests of welds, 441*A*.
DAHL, O.:
  iron-nickel alloys, 515*A*.
  magnetic properties of electrolytic sheet iron, 504*A*.
DAHL, T., flow of metal in rolling, 398*A*.
DANIELS, E. J., tin coatings, 453*A*.
DANILOFF, B. N., effect of deoxidation on ageing, 477*A*.
DAUBOIS, heat treatment of cast steel, 424*A*.
DAVENPORT, E. S., ageing of steel, 476*A*.
DAVIDSON, C. F., welding of sheets, 438*A*.
DAVIES, D. G., effect of casting temperature on blowholes in ingots, 392*A*.
DAVIES, D. T., grading of coal, 340*A*.
DAVIES, W. R., obituary notice, 311.
DAVIS, N. L., handling devices, 413*A*.
DAVISON, V. W., elected member, 8.
DAWSON, S. E., determination of moisture in moulding sand, 367*A*.
DEAN, R. S., direct production of iron, 359*A*.

DEANS, W., circuit breakers for steel mills, 410*A*.
DECOUX, A., elected member, 8.
DELBART, G., elastic limit of structural steel, 470*A*.
DESCH, C. H., flow of metals, 125*D*.
DEWULF, N., effect of cold-work on boiler plate, 481*A*.
DIENBAUER, J., electrodeposition of copper-nickel-iron alloys, 449*A*.
DIERKER, A. H., combustion in cupolas, 363*A*.
DIGGES, T. G., hardening characteristics of tool steel, 508*A*.
DI GUILIO, A., effect of superheating on cast iron, 464*A*.
DITHMER, S. E., nickel alloys for automobile construction, 496*A*.
DIXON, S. M., deterioration of haulage ropes, 498*A*.
DOBSON, W. E., elected member, 8.
DONALDSON, J. W.:
alloys for shipbuilding, 495*A*.
marine corrosion, 526*A*.
properties of alloys, 506*A*.
DÖPFER, H., austenite transformation in alloy steel, 512*A*.
DOST, F. J., alloy cast iron, 467*A*.
DOUGHTY, E. H., roller bearings, 401*A*.
DREHER, G. K., use of bronze for dies, 394*A*.
DUBOIS, H., strickle moulding of castings, 370*A*.
DUQUÉNOY, M., welding of sheets, 438*A*.
DUTILLEUL, power stations for welding, 432*A*.
DWYER, P.:
gates and risers, 365*A*.
plant of Homestead Valve Co., 374*A*.
plant of Mackintosh-Hemphill Co., 369*A*.

EASTHAM, H. H., moulding of fly-wheel hubs, 370*A*.
EBERT, H., compressibility of solid bodies, 469*A*.
EBRIGHT, H. E., enamelling, 456*A*.
EDWARDS, C. A., effect of casting temperature on blowholes in ingots, 392*A*.
EGGLESTON, S., conveyors for steel mills, 412*A*.
EILENDER, W., ageing of steel, 478*A*.
EINECKE, G., iron ore in Germany, 322*A*.
EISENKOLB, F., corrosion tests of steel sheets, 524*A*.
ELL, O., insulation of furnaces, 331*A*.
ELLINGER, G. A., etching reagent for stainless steel, 506*A*.
ELLINGHAM, H. J. T., plating baths, 448*A*.
ELLIS, C., insulating materials, 331*A*.
ELLIS, O. W., wear of cast iron, 462*A*.
ELISS, H., steel melted *in vacuo*, 392*A*.
EMMERLING, K., natural gas, 350*A*.
ENDELL, K., tridymite in silica brick, 328*A*.
ENDERS, W., stress-elongation curves of steel, 482*A*.
ENDÔ, H., corrosion of mild steel, 525*A*.
ENDO, K., oxidation of iron, 422*A*.
EPSTEIN, S., metallurgical investigations in Germany, 383*A*.
ERBER, G., calculation of notch fatigue strength, 488*A*.
ERSPAMER, A., electrodeposition of tin, 450*A*.
EUCKEN, A., thermal conductivity of sheets, 482*A*.
EULER, H., temperature measurement, 417*A*.
EVANS, C. L., texture of refractories, 329*A*.
EVANS, E. C., fuel economy in iron industry, 336*A*.
EVANS, G., seamless tubes, 408*A*., 409*A*.
EVANS, U. R.:
corrosion probability, 520*A*.
soil resistance and underground currents, 527*A*.
EVERTS, T., hardness of sprayed coatings, 455*A*.
EWING, J. A., obituary notice, 312.
EYERMANN, P., elected member, 8.

FABRE, H., strickle moulding of castings, 370*A*.
FALK, A. E., centrifugal casting of piston cores, 371*A*.
FARNHAM, G. S., wear of cast iron, 462*A*.
FARR, W. S., deseaming of billets, 411*A*.
FAULKNER, V. C., foundry of Winget, Ltd., 374*A*.
FEIL, E., separation of loam cores, 365*A*.
FELL, E. W.:
Paper on "The Piobert Effect in Iron and Soft Steel," 75. *Correspondence*, 92. *Author's Reply*, 96.
flow of metals, 126*D*.
FELLOWS, C. W., elected member, 8.
FELLS, H. A., combustion, 334*A*.

FENWICK, F., protective coatings, 449*A*.
FERNEY, L. A.:
electric resistance seam welding, 432*A*.
welding of machine tools, 437*A*.
FERRIS, I. J., elected associate, 9.
FICAI, C., electrical distillation of coal, 347*A*.
FIEK, G., fatigue tests of welds, 441*A*.
FIELD, A. L., slag control, 385*A*.
FIELDING, A. W., wire-drawing, 414*A*.
FIELDNER, A. C., coking properties of coal, 344*A*.
FINDLEY, J. K., drawing of stainless steel, 415*A*.
FINNEY, B., granodising process, 454*A*.
FINNIGAN, T. J., corrosion of steel, 523*A*.
FIRST, G. W., sheet measuring device, 412*A*.
FISCHBECK, K., scaling of iron, 421*A*.
FLETCHER, J. E., cupola practice, 363*A*.
FOLEY, F. B., slag control in acid process, 385*A*.
FONTANA, M. G., reaction of hydrogen with ferrous oxide, 380*A*.
FORBES, D. P., malleable cast iron, 373*A*.
FORRESTER, C., coal in Bihar and Orissa, 322*A*.
FORSTER, A. L., glass silk, 332*A*.
FOSTER, C. E., pyrometers, 416*A*.
FOURMENT, M., sintering of iron ore, 325*A*.
FOXWELL, G. E., oil yield from coke-ovens, 345*A*.
FRANCELLE, H., elastic limit of structural steel, 470*A*.
FRANCIS-CARTER, C. F. J., cathodic coatings, 449*A*.
FRANKIGNOUL, E., elected member, 8.
FRÄNKL, M., steel production in blast furnace, 360*A*.
FRANKLIN, W. W., rolling mill construction, 400*A*.
FRANKS, R., effect of nitrogen in chromium steel, 519*A*.
FRAUNTHAL, A. H., effect of roll neck deflection on bearing life, 400*A*.
FRIEND, W. Z.:
propane, 353*A*.
propane for bright annealing, 423*A*.
FUJII, Y., cold-shortness in metals, 479*A*.

GADD, E. R., aircraft engine materials, 424*A*.
GAIR, C. J. D., spectrum analysis, 531*A*.
GALLO, P. M., design of electric drives, 410*A*.
GANDHI, N. P., elected member, 8.
GARDOM, J. W., cast iron for enamelling, 456*A*.
GARNER, R. H., elected member, 8.
GARRATT, F., high-speed steel, 494*A*.
GARRE, G., porosity in zinc coatings, 452*A*.
GAWLICK, H., twin calorimeter, 333*A*.
GEARY, W., elected member, 8.
GEGG, C. C., elected associate, 9.
GEIPEL, H., creep tests, 484*A*.
GEISLER, W., automobile castings, 467*A*.
GELLER, W., iron-cobalt-tin system, 514*A*.
GENSAMER, M., Lüders lines in carbon steel, 475*A*.
GERB, W., floor vibrations in foundries, 364*A*.
GERMEAU, H., elected member, 8.
GEZELIUS, R. A., contraction of steel castings, 375*A*.
GIBSON, A. E., high-tensile low-alloy steels, 494*A*.
GILBERT, W. W., cutting tests, 481*A*.
GILL, E. T., and R. GOODACRE:
Paper on "Some Aspects of the Fatigue Properties of Patented Steel Wires," Part II. Note on the Effect of Low-Temperature Heat-Treatment 143. *Discussion*, 166. *Correspondence*, 168. *Authors' Reply*, 173.
GIRARDET, L. E. C., refining cast iron with soda ash, 363*A*.
GLEICHMANN, H., Benson boiler, 336*A*.
GLOCKER, R., magnet steels, 505*A*.
GÖBEL, O., Terni open-hearth furnaces, 378*A*.
GOOD, R. C., slag control, 385*A*.
GOODACRE, R.:
Paper on "Some Aspects of the Fatigue Properties of Patented Steel Wires." *See* Gill, E. T.
effect of oils on fatigue strength of steel wire, 491*A*.
GOODRICH, W. E.:
Paper on "The Penetration of Molten White Metals into Stressed Steels," 43. *Correspondence*, 65. *Author's Reply*, 66.
GORDAN, J. R., wear of cast iron, 462*A*.
GOSS, N. P., grain distortion during heat treatment, 424*A*.
GÖTTE, A., coal cleaning, 339*A*.

GOUGH, H. J.:
fatigue tests of safety hook, 491*A*.
elected member, 8.
GRANGER, L., raw-materials in open-hearth practice, 378*A*.
GRANJON, R., elected member, 8.
GREAVES, R. H.:
Paper on "The Properties of Some Low-Nickel Steels containing Manganese," 99. *Correspondence*, 114. *Author's Reply*, 115.
GREEN, V. E., inspection of materials, 506*A*.
GREENE, O. V., torsion impact properties of tool steel, 474*A*.
GREGORY, C. V., individual drives for run-out tables, 410*A*.
GREGSON, W., waste-heat boilers, 336*A*.
GREIG, J. W., equilibrium relationships of Fe_3O_4, Fe_2O_3 and oxygen, 421*A*.
GRENE, G. H. S., heat-treatment furnaces, 418*A*.
GRETHE, K., reducibility of sinter, 358*A*
GREWE, H., steelworks tars, 379*A*.
GRIFFITHS, J., coal washing, 340*A*.
GRIFFITHS, R.:
Paper on "Subcutaneous Effects during the Scaling of Steel," 67. *Correspondence*, 72. *Author's Reply*, 74.
GRIMES, G. J., pickling of sheet steel, 447*A*.
GROVES, H. A., McQuaid-Ehn grain-size of steel, 508*A*.
GRUNERT, resistance alloys, 517*A*.
GUÉDRAS, M., electric furnaces, 385*A*.
GUELLICH, G. E., constituents in steel, 509*A*.
GULANKAJA, Z., electrochemical potential of iron, 520*A*.
GUMZ, W., corrosion of preheaters, 526*A*.
GURNEY, D. M., plant of Sterling Foundry Co., 375*A*.
GUTHMANN, K., temperature measurement, 417*A*.

HÄHN, W., gas measurement, 337*A*.
HALASZ, R. VON, moulding sand, 367*A*.
HALE, G. E., elected member, 8.
HALEM, O. VON, history of iron, 361*A*.
HALL, G. M., coal, oil and gas in Montana, 323*A*.
HALL, H. F., elected member, 8.
HALL, P. E., determination of nitrogen in coal, 532*A*.
HAMACHER, N., iron ore at Rosenberg, 323*A*.
HAMANN, C. W., tests of welds, 441*A*.
HAMILTON, J. W., endurance of malleable cast iron, 468*A*.
HANKS, F. T., determination of moisture in moulding sand, 367*A*.
HANNAH, J. D., use of Hele-Shaw apparatus, flow of metals, 127*D*.
HANSEN, J. E., nickel dip in enamelling, 456*A*.
HARBACH, G. L., tests of cast iron, 459*A*.
HARDING, R. C., obituary notice, 314.
HARNSBERGER, A. E., materials for oil-refinery pumps, 499*A*.
HARPER, W. A., Klönne gasholder, 352*A*.
HARRELL, F. E., individual drives for run-out tables, 410*A*.
HARRELSON, O. M.:
contraction of welds, 443*A*.
peening of welds, 440*A*.
HARRINGTON, W. A., wear tests, 479*A*.
HARVEY, F. A., Forsterite refractories, 328*A*.
HATFIELD, W. H.:
alloy steels for aircraft construction, 495*A*.
effect of inclusions on flow of metals, 128*D*.
steel castings, 371*A*.
HATTA, A., quenching of steel, 428*A*.
HAY, R., slag systems, 387*A*.
HECKEL, H., power consumption in wire-drawing, 413*A*.
HEDGES, E. S., equilibrium diagram of tin alloys, 516*A*.
HEILIGENSTAEDT, W., heating of ingots in soaking pits, 393*A*.
HENNING, C. C., Bessemer steel, 376*A*.
HÉNON, G., metal losses in cupolas, 363*A*.
HEPBURN, W. M., controlled atmospheres in furnaces, 418*A*.
HERBERT, A. M., and F. C. THOMPSON:
Paper on "The Use of the Hele-Shaw Apparatus in the investigation of the Flow of Metals," 117. *Discussion*, 125. *Correspondence*, 130. *Authors' Reply*, 131.
HERRING, H., Samum sand-preparing machine, 367*A*.
HERSEY, M. D., lubrication, 402*A*.
HERTY, C. H., jun.:
effect of deoxidation on ageing, 477*A*.
effect of deoxidation on ferrite formation, 509*A*.

HERZOG, G. K., alloy steels for boilers, 500*A*.
HESSENBRUCH, resistance alloys, 517*A*.
HETTRICK, W., welding, 443*A*.
HEUER, H. P., Ritex chrome brick, 327*A*.
HEWITT, L. C., refractories for malleable iron furnaces, 330*A*.
HIBBARD, H. D., tensile strength of soft steel, 470*A*.
HICKS, W. R., corrosion tests, 525*A*.
HIEBER, G., oxygen-phosphorus equilibrium, 358*A*.
HIGGINS, R., effect of casting temperature on blowholes in ingots, 392*A*.
HIGHTON, L., elected member, 9.
HILL, N. W., specific surface of coal particles, 339*A*.
HIPKINS, W., obituary notice, 314.
HIRST, C. W.:
nickel-manganese steels, 115*D*.
steel stressed at 300° C., 288*D*.
HITCHCOCK, J. H., self-aligning bearings, 400*A*.
HITCHIN, C. S., spectrum analysis, 531*A*.
HOARE, W. E., optical examination of tinplate, 454*A*.
HOARE, W. E., and B. CHALMERS:
Paper on "Examination of the Surface of Tinplate by an Optical Method," 135.
HOBBS, H. G., use of zinc ammonium chloride in galvanising, 471*A*.
HOCH, welding of machine tools, 437*A*.
HOCKEY, F. R., elected member, 9.
HODGSON, C. C., case-hardening steel, 419*A*.
HOFF, H., forge tests of welds, 441*A*.
HOFFMANN, resistance alloys, 517*A*.
HOFFMANN, H., Saar coal, 343*A*.
HOFFMANN, W.:
steel tubes for aircraft, 443*A*.
tensile tests of welds, 441*A*.
HOFFMEISTER, B., roof evacuation from coke-ovens, 345*A*.
HOFMANN, U., tridymite in silica brick, 328*A*.
HOGAN, M. A., deterioration of haulage ropes, 498*A*.
HOLBROOK, W. F., silica and alumina in iron ore, 357*A*.
HOLMBERG, J. C., welding of alloy steel, 434*A*.
HOLMES, E. P., elected member, 9.
HOMER, C. E., equilibrium diagram of tin alloys, 516*A*.
HOMERBERG, V. O., nitriding of cast iron, 420*A*.
HONDA, K., A_2 transformation, 511*A*.
HOOD, S. R., elected member, 9.
HORGER, O. J., photo-elastic tests, 474*A*.
HORVITZ, G. J., grain-size control in forgings, 425*A*.
HOTHERSALL, A. W., electrodeposited tin coatings, 453*A*.
HOUDREMONT, E.:
case-hardening alloy steel, 420*A*.
heat treatment of tool steel, 427*A*.
HOUGHTON, F., elected member, 9.
HOUSLEY, W. L., adherence of enamels, 457*A*.
HOYT, S. L., resistance alloys, 518*A*.
HRUSKA, J. H.:
fuels for open-hearth furnaces, 378*A*.
hardness tests of nitrided steel, 479*A*.
HSIEH, C. Y., iron ore in China, 324*A*.
HUGHES, G. A., welding, 433*A*.
HUGO, E., section susceptibility of cast iron, 464*A*.
HUMMITZSCH, W., austenitic material in fusion welding, 436*A*.
HUNT, L. B., welding of sheets, 438*A*.
HUNTING, F. F., obituary notice, 314.
HURST, J. E.:
alloy cast iron, 466*A*.
elastic properties of steel, 470*A*.
HUSSON, G., deoxidation of steel, 383*A*.
HYSLOP, Sir R. M., obituary notice, 315.

IKEDA, S., bend tests of cast iron, 460*A*.
IMHOFF, W. G.:
fluxes for galvanising, 452*A*.
submersion time in galvanising, 452*A*.
IRWIN, J. T.:
enamelling, 456*A*.
nickel dip in enamelling, 456*A*.

JACK, G. B., grain-size control in forgings, 425*A*.
JACKSON, A.:
Appleby plant of United Steel Companies, Ltd., 388*A*.
effect of nozzle refractories on teeming speeds, 391*A*.
JACOBUS, D. D., corrosion of steel, 523*A*.
JACOBUS, D. S., stress relief of pressure vessels, 440*A*.
JAMES, W. L., elected member, 9.
JAMIESON, R. E., residual stress effects in tension specimens, 475*A*.
JAMM, W., steel containers for motor fuels, 444*A*.

JANSSON-FOLLIN, C. G. L., elected member, 9.
JEFFERSON, R. E., texture of refractories, 329*A*.
JENKINS, C. H. M.:
Paper on "The Behaviour of Mild Steel under Prolonged Stress at 300° C.," Part II—Experiments on Concentrated Stress in Notched and Drilled Specimens, 281. *Correspondence*, 288. *Author's Reply*, 288.
JENKINS, C. H. M., and G. A. MELLOR: *Paper on* "Investigation of the Behaviour of Metals under Deformation at High Temperatures," Part I—Structural Changes in Mild Steel and Commercial Irons During Creep, 179. *Discussion*, 228. *Correspondence*, 230. *Authors' Reply*, 234.
JENKNER, A., oil yield from coke ovens, 345*A*.
JENNINGS, C. H., welding of bronze overlays, 437*A*.
JENNINGS, W. R., high-duty cast iron, 364*A*.
JENSEN, R., weld metal *versus* rolled steel, 443*A*.
JOHANNESEN, J. K., welding of engine seating structures, 437*A*.
JOHNSON, H. H., graphitising reactions, 468*A*.
JOHNSON, J. S., porosity in welds, 443*A*.
JONES, J. A.:
nickel-manganese steels, 114*D*.
stressed metals at high temperatures, 230*D*.
JONES, J. W., photomicrographs, 507*A*.
JONES, W. D., iron-zinc diagram, 516*A*.
JORDAN, L., hardening characteristics of tool steel, 508*A*.
JOSEPH, T. L., silica and alumina in iron ore, 357*A*.
JUNGE, C. H., graphitising reactions, 468*A*.
JÜRGENS, K., Werk Konigshuld, 390*A*.
JÜRGENSMEYER, W., roller bearings, 401*A*.

KAGAN, M., sponginess in iron, 375*A*.
KAISER, J. D., use of bronze for dies, 394*A*.
KALPERS, H., steel bells, 372*A*.
KAR, H. A.:
analysis of chromium steel, 530*A*.
determination of sulphur, 530*A*.
KARSCHULIN, M., potential of iron in nitric acid, 521*A*.
KARSTEN, A., metal spraying of castings, 455*A*.
KARWAT, E., oxygen-enriched blast, 357*A*.
KASE, T., cementation of metals by tin, 418*A*.
KASPER, C., electrodeposition of chromium, 450*A*.
KÄSTEL, E., wire mill in Japan, 403*A*.
KAUCHTSCHISCHWILI, M., electric furnaces, 385*A*.
KAUTZ, K., Krupp welding process, 435*A*.
KEATING, F. H., elected member, 9.
KEELAN, T. N., defects in strip, 408*A*.
KEENER, S. F., tempering of bearings, 428*A*.
KELLOGG, C. A., tests of wire, 468*A*.
KENYON, J. N., fatigue testing machine for wire, 486*A*.
KERNAHAN, W. C., forging presses, 394*A*.
KERR, R., use of sodium sulphite for tinned ware, 454*A*.
KESSNER, hardness of sprayed coatings, 455*A*.
KIHLSTEDT, P. G., concentration of titaniferous iron ore, 325*A*.
KING, J. G., hydrogenation of coal, 352*A*.
KING, R. M.:
adherence of enamels, 457*A*.
enamels, 457*A*.
KINNEAR, H. B., copper stools for ingot moulds, 391*A*.
KINZEL, A. B., tests of slags, 385*A*.
KIRKE, P. ST. G., heat transmission in boilers, 337*A*.
KITCHING, J., obituary notice, 315.
KJERRMAN, B., transformation temperatures of martensite and austenite, 513*A*.
KLARDING, J., blast-furnace burdens, 357*A*.
KLEINEFENN, W., notch toughness of fusion welds, 442*A*.
KNECHT, W., α-γ transformation, 511*A*.
KNERR, H. C., nitriding of tool steel, 420*A*.
KNÜPPEL, H., ageing of steel, 478*A*.
KOEPPEL, C., coke-oven door brick, 329*A*.
KOHL, E., iron ore in Germany, 323*A*.

KOLTHOFF, I. M., determination of manganese in steel, 529*A*.
KOMERS, M., bend tests of welds, 441*A*.
KOMOVSKI, electrodes for spot welding, 432*A*.
KÖRBER, F.:
action of carbon on acid-slag reactions in steel making, 382*A*.
properties of rails, 501*A*.
KORSCHAN, H., effect of forging on properties of steel, 396*A*.
KOSHEWNIKON, J., chromium-molybdenum steel tubes, 408*A*.
KÖSTER, W., iron-cobalt-tin system, 514*A*.
KRAISCHEW, R., crystal growth, 508*A*.
KRÄMER, W., sheet mills, 405*A*.
KRAUS, C. E., cutting tests, 481*A*.
KREBS, E., roof evacuation from coke-ovens, 345*A*.
KREBS, W., plant of South African Iron and Steel Industrial Corporation, 390*A*.
KREUGER, H., roof evacuation from coke-ovens, 345*A*.
KROLL, W., desulphurisation of steel by beryllium, 384*A*.
KUFFERATH, A., microscope, 375*A*.
KÜHLWEIN, F. L., Saar coal, 343*A*.
KÜHNEL, R., tensile tests of welds, 441*A*.
KÜRSCHNER, welding of pipes, 438*A*.
KUSSMANN, A., permanent magnets, 505*A*.

LAFFARGUE, recuperators, 338*A*.
LAHOUSSAY, L., de-dusting of gas, 350*A*.
LAISSUS, J., cementation of iron by beryllium, 418*A*.
LAKE, E. F.:
decarburisation of steel, 423*A*.
hardening and tempering, 426*A*.
LANNING, L. A., selective carburisation, 419*A*.
LA QUE, F. L., corrosion tests, 522*A*.
LARKE, SIR W. J., history of iron, 361*A*.
LEA, F. C., fatigue tests on steel wire, 170*D*.
LEBLANC, A., properties of nickel and nickel-chromium steels, 472*A*.
LECKIE, F., propane for bright annealing, 423*A*.
LEE, O. R. J., elected associate, 9.
LEFEBVRE, A. G., refining cast iron with soda ash, 363*A*.
L'HERMITE, R., laboratories in Paris, 528*A*.
LEHR, E., bending fatigue strength of stepped shafts, 490*A*.
LENNINGS, W., oxygen-enriched blast, 355*A*.
LEON, A.:
bleeding of steel, 480*A*.
effect of prestressing on cast iron, 461*A*.
LEONHARDT, R.:
gas measurement, 337*A*.
multi-casting process, 369*A*.
LEROY, A., corrosion of welds, 526*A*.
LEWIS, K. B.:
die stresses and die wear, 413*A*.
inhibitors in pickling, 447*A*.
LEWIS, K. G.:
scaling of steel, 73*D*.
soil resistance and underground currents, 527*A*.
LEWIS, P. S., metallic coatings, 448*A*.
LIBOTTE, C. M. F. R., elected member, 9.
LIÉBAUT, A., heat exchangers, 338*A*.
LIEDHOLM, C. A., retained austenite in high-speed steel, 430*A*.
LINDSEY, G. S., enamels, 457*A*.
LINGANE, J. J., determination of manganese in steel, 529*A*.
LIPPERT, T. W., shorterising, 420*A*.
LITTERSCHEIDT, W., roof evacuation from coke-ovens, 344*A*.
LITVIN, P. L., electrification in Russian plants, 337*A*.
LLOYD, G. C., presentation to, 5.
LOBECK, A., straightening of rails, 412*A*.
LOBLEY, A. G., electric heat-treatment furnaces, 417*A*.
LOCUTY, P., ammonia recovery, 348*A*.
LONGENECKER, C., sheet mills of Youngstown Steel and Tube Co., 405*A*.
LUCAS, F. F., preparation of specimens for metallographic work, 506*A*.
LUEG, W.:
cold-rolling of strip, 407*A*.
stress-elongation curves of steel, 482*A*.
LUERSSEN, G. V., torsion impact properties of tool steel, 474*A*.
LUNT, G. T., refined pig iron, 364*A*.
LYNN, C., motor-generator equipment, 410*A*.

MCALLISTER, L. P., alloy steels for boilers, 500*A*.

McBride, D. L., effect of deoxidation on ferrite formation, 509*A*.
McCall, M. M., billet gauger, 411*A*.
McCance, A., flow of metals, 129*D*.
McCollam, C. H., pitting of metals during pickling, 448*A*.
McConnachie, W., metal losses in cupolas, 363*A*.
McCormick, J. T., elected member, 9.
McCosh, W. W., obituary notice, 315.
McDermott, G. R., soaking pits, 393*A*.
McElwee, R. G., heat treatment of cast iron, 431*A*.
MacGregor, R. A., fatigue of marine engine parts, 490*A*.
McIntosh, A. B., slag systems, 387*A*.
McIntyre, G. H., enamelling, 456*A*.
Mackenzie, T. B., obituary notice, 315.
McMullan, O. W., endurance of case-hardened gears, 488*A*.
MacPherran, R. S., test bars for cast iron, 459*A*.
McQuaid, H. W., effect in aluminium in steel, 493*A*.
Maddocks, W. R., FeO–MnO–SiO_2 system, 388*A*.
Maegdefrau, E., tridymite in silica brick, 328*A*.
Mahadevan, C., X-ray examination of coal, 338*A*.
Mahin, E. G., endurance of malleable cast iron, 468*A*.
Mailänder, R.:
bending fatigue strength of stepped shafts, 490*A*.
impact tests of welds, 441*A*.
notch sensitiveness of steel, 473*A*.
standardisation of impact test-bars, 472*A*.
Makariewa, S. P., electrodeposition of chromium, 451*A*.
Marcotte, E., low-temperature carbonisation, 347*A*.
Marette, J., seamless tubes, 409*A*.
Marshall, J. R., desulphurisation of coke-oven gas, 351*A*.
Mason, J. B. M., coal briquetting, 343*A*.
Mason, W., yield of steel wire under stress, 490*A*.
Mathews, J. A., obituary notice, 316.
Matsukawa, T., viscosity of slags, 387*A*.
Matting, A., tensile tests of welds, 441*A*.
Mattocks, E. O., combustion of gas, 334*A*.
Maulbetch, S., photo-elastic tests, 474*A*.
Maumann, F. K., corrosion-resistant steel, 519*A*.
Maurer, E., effect of forging on properties of steel, 396*A*.
Maurer, E., and W. Bischof:
Paper on "The Distribution of Phosphorus between Metal and Slag in the Basic Process of Steel Manufacture," 13.
Mawka, J. K., control of furnaces, 337*A*.
Maxwell, H. L., properties of metals at high temperatures, 486*A*.
Mayer, C. F., tempering of roller bearings, 417*A*.
Mears, R. B., corrosion probability, 520*A*.
Mehl, R. F.:
alpha-gamma transformation, 512*A*.
effect of deoxidation on ageing, 477*A*.
Lüders lines in carbon steel, 475*A*.
effect of deoxidation on ferrite formation, 510*A*.
Mehovar, J., properties of rails, 501*A*.
Mellon, J. J., electric controllers for screwdowns, 399*A*.
Mellor, G. A.:
Paper on "Investigation of the Behaviour of Metals under Deformation at High Temperatures." *See* Jenkins, C. H. M.
Merica, P. D.:
age-hardening of steel, 476*A*.
alloys of high thermal and magnetic stability, 485*A*.
Merklen, J., fracture of pylon, 502*A*.
Merwin, H. E., equilibrium relationships of Fe_3O_4, Fe_2O_3 and oxygen, 421*A*.
Messkin, W. S., nickel-aluminium magnet steel, 504*A*.
Michel, A., tool steel, 427*A*.
Miller, A. P., slag control in rail steel making, 385*A*.
Miller, C. C., alloy cast iron, 364*A*.
Miller, H. L., copper-nickel-molybdenum steel, 496*A*.
Mishima, T., elected member, 9.
Mitchell, P. J., obituary notice, 317.
Mitsche, R., metallurgy of iron, 506*A*.
Mitton, H. E., grading of coal, 340*A*.
Miwa, M., polished layer of metals, 507*A*.
Mohr, A., jun.:
blast-furnace stoves, 355*A*.
gas cleaning, 351*A*.
Möller, H., X-ray examination of metals, 507*A*.
Moody, C., elected member, 9.

MOORE, H. F., effect of overload on strength of metals, 487*A*.
MOREAU, L., gases in metals, 532*A*.
MORESSÉE, G., electric welding, 433*A*.
MORGAN, W. G., foundry practice, 362*A*.
MORRISON, J. R., convection heating, 423*A*.
MORROW, J. B., coal sampling, 532*A*.
MORT, E. R., normalising of sheets, 424*A*.
MOTHERWELL, G. W., forge shop in Japan, 394*A*.
MOULTON, G. F., coal, oil and gas in Montana, 323*A*.
MOXLEY, S. D., dust collection in foundries, 364*A*.
MUELLER, H., cavitation in turbines, 527*A*.
MÜLLER, E. W., corrosion and scaling of structural steel, 524*A*.
MÜLLER, H.:
calculation of loops for rod mills, 404*A*.
charge weight of billets, 402*A*.
strip mills, cost of operation, 408*A*.
MÜLLER, W., effect of temperature on deformation of metals, 396*A*.
MÜLLER, W. J., passivity phenomena, 521*A*.
MURAKAMI, T.:
corrosion of mild steel, 525*A*.
quenching of steel, 428*A*.
MURPHY, A. M. C., heat-resistant alloys, 518*A*.
MURPHY, D. W., austenitic grain-size in cast iron, 462*A*.
MURRAY, J. V., malleable cast iron, 373*A*.

NADÁI, A., Piobert effect, 92*D*.
NAGASAWA, temper-brittleness, 431*A*.
NAKAMURA, K., elasticity of ferromagnetic substances, 471*A*.
NASHAN, P., capillarity of coal, 338*A*.
NEALEY, J. B.:
centrifugal casting of pipe, 370*A*, 371*A*.
heat treatment of springs, 425*A*.
luminous flame heating, 335*A*.
NEEDHAM, L. W., specific surface of coal particles, 339*A*.
NEESE, H. E., fatigue of welds, 442*A*.
NEILSON, J., obituary notice, 318.
NEKRASSOW, N., electrochemical potential of iron, 520*A*.
NERNST, L., cadmium plating, 451*A*.
NETTLENBUSCH, L., oil yield from coke-ovens, 345*A*.
NEUMANN, A. J., elected member, 9.
NEWALL, H. F., combustion of pulverised coal, 342*A*.
NICHOLLS, P., fuel beds, 335*A*.
NIETEN, W., rolling mill construction, 403*A*.
NIPPER, H., section susceptibility of cast iron, 464*A*.
NISHIGORI, S., nitriding of steel, 420*A*.
NISHIYAMA, Z., austenite and martensite in steel, 510*A*.
NIXON, E. B., welding of mild steel, 439*A*.
NOBLE, W. N., enamels, 457*A*.
NORRIS, F. G., slag control in steelmaking, 385*A*.
NORTHCOTT, L., constitution of steel and effect of differential solidification on segregation, 392*A*.
NÜBEL, R., determination of calorific value, 333*A*.
NUSBAUM, C., grain distortion during heat treatment, 424*A*.

OBREBSKI, J., steel castings, 375*A*.
OELSEN, W., action of carbon on acid slag reactions in steelmaking, 382*A*.
OKAMURA, K., bend tests of cast iron, 460*A*.
OKUDA, H., nickel alloys for automobile construction, 496*A*.
OLDERSHAW, F., moulding of pulley wheels, 369*A*.
OLIVER, S. K., hardening of tool steel, 426*A*.
OLLARD, E. A., electrodeposition of chromium, 450*A*.
OLSEN, J. K., estimation of blanks for drawn parts, 397*A*.
ORR, J., electric arc welding, 433*A*.
OTTO, J., welding machines, 432*A*.
OWESNY, F., jun., welding of tubes, 437*A*.

PALMGREN, G., roller bearings, 401*A*.
PARKER, D. M. S., elected member, 9.
PARKER, R., elected associate, 9.
PARKER, R. T., iron-zinc diagram, 516*A*.
PARMITER, O. K., forging of stainless steel, 395*A*.
PARTRIDGE, E. P., embrittlement of boilers, 478*A*.
PASCHKE, M., effect of phosphorus in cast iron, 466*A*.

PATTERSON, S. R., obituary notice, 318.
PATTERSON, W. S., corrosion of iron, 523*A*.
PATTERSON, W. M., hardness testing machine, 479*A*.
PAWECK, H., electrodeposition of copper-nickel-iron alloys, 449*A*.
PAWLEK, F.:
magnetic properties of electrolytic sheet iron, 504*A*.
magnetic properties of iron-nickel alloys, 503*A*.
PERTIERRA, J. M., hydrogenation of coal, 352*A*.
PESSL, H., metallurgy of iron, 506*A*.
PETERS, F. J., heat-resistant paints, 458*A*.
PETERS, F. P., resistance alloys, 517*A*.
PETIT, D., refractory materials, 327*A*.
PETUNNIKOV, G., chromite in South Slavia, 323*A*.
PFAFFENBERGER, J.:
iron-nickel alloys, 515*A*.
magnetic properties of electrolytic sheet iron, 504*A*.
PFISTER, H., magnet steels, 505*A*.
PHILLIPS, A., effect of furnace atmosphere on molybdenum high-speed steel, 422*A*.
PHILLIPS, G. P.:
impact resistance of cast iron, 460*A*.
superheating of cast iron, 463*A*.
PICKERING, W. B., manganese steel for crushing machines, 497*A*.
PIWOWARSKY, E.:
copper steel, 497*A*.
properties of cast iron at high temperatures, 461*A*.
section susceptibility of cast iron, 464*A*.
PLOYÉ, M., effect of aluminium in cast iron, 465*A*.
POHL, H., high-speed steel, 427*A*.
POLLACK, H., high-speed steel, 427*A*.
POLLOCK, J. E., corrosion tests of metals, 525*A*.
PÖLZGUTER, F.:
high-frequency furnaces, 385*A*.
magnet steels, 504*A*.
POMP, A.:
cold-rolling of strip, 407*A*.
power consumption in wire-drawing, 413*A*.
POOLE, S. L., fuel economy in iron industry, 336*A*.
PORTEVIN, A., gases in metals, 532*A*.
PORTEVIN, A. M., and R. CASTRO:
Paper, "Morphology of the Inclusions in Siderurgical Products," 237. *Correspondence*, 275. *Authors' Reply*, 276.
POSNJAK, E., equilibrium relationships of Fe_3O_4, Fe_2O_3 and oxygen, 421*A*.
POSTE, E. P., enamels, 457*A*.
POTTENGER, C. H., determination of sulphur, 530*A*.
PRENTISS, F. L., Niles sheet mill, 405*A*.
PRIMROSE, J. S. G., fatigue testing machines, 487*A*.
PROCTOR, C. P., coal sampling, 532*A*.
PROCTOR, W. H. W., obituary notice, 319.
PUGH, M. D., pyrometers, 416*A*.
PÜNGEL, W., deep-drawing tests, 397*A*.

QUANDEL, K., steelworks tars, 379*A*.

RABBITT, J. A., nickel alloys for automobile construction, 496*A*.
RABINOVITSCH, T., tests of lubricants, 402*A*.
RAINE, T., inclusions in ingots, 392*A*.
RAJAKOVICS, E. VON, notch-sensitiveness of cast iron, 460*A*.
RANSLEY, C. E., diffusion of gases in metals, 492*A*.
RANSHOFF, N., metal cleaning, 445*A*.
RAPATZ, F.:
austenitic material in fusion welding, 436*A*.
folding tests of welds, 441*A*.
RATHERT, F., pulverised-fuel boilers, 342*A*.
RAU, G., coal cleaning, 340*A*.
RAWDON, H. S.:
corrosion tests, 522*A*.
Piobert effect, 95*D*.
REAGAN, W. J., slag control in basic process, 385*A*.
REERINK, W., roof evacuation from coke ovens, 344*A*.
REES, W. J., cupola refractories, 329*A*.
REID, R., elected member, 9.
REID, W. T., fusion temperatures of coal ash, 333*A*.
REIN, C., auxiliary tuyeres in cupolas, 362*A*.
REINARTZ, L. F., slag control in making rimming steel, 385*A*.
REINGOLD, L., flame temperatures, 334*A*.
REIS, A., reactivity of coke, 349*A*.

REITLER, E., thickness measurement of protective coatings, 451*A*.
RHEAD, T. F. E., texture of refractories, 329*A*.
RHOADS, A. E., electric-furnace cast iron, 364*A*.
RIBAUD, G., flame temperatures, 335*A*.
RICHARDS, J. S., elected member, 9.
RIDLEY, F. F., coal cleaning, 340*A*.
RIDSDALE, C. H., obituary notice, 319.
RIETSCH, E., electric resistance welding, 433*A*.
RIGBY, C. L., magnesite bricks, 328*A*.
RIGGAN, F. B., malleable cast iron, 373*A*.
RIMMER, J. A., elected member, 9.
RIST, R., fissures in boilers, 500*A*.
RITCHIE, R. J. H., obituary notice, 320.
ROBB, H. D., roller bearings, 401*A*.
ROBERTS, J., properties of coke, 349*A*.
ROBINSON, E. L., stability of steel, 485*A*.
ROBSON, S., metallic coatings, 448*A*.
ROCQUET, P., elected member, 9.
RODDA, J. L., iron-zinc system, 516*A*.
ROHLAND, W., elected member, 9.
ROLFE, R. T.:
bright and free-cutting steels, 495*A*.
heat treatment of steel, 425*A*.
ROMBERG, H., Pishel's cokability test, 343*A*.
ROSEMAN, R., estimation of iron, 529*A*.
ROSENDAHL, F., benzol yield from coke-ovens, 344*A*.
ROWLAND, D. H., effect of grain-size on surface decarburisation of steel, 423*A*.
ROYEN, H. J. VAN, steelworks tars, 379*A*.
RUDSKI, G., rolling of bars, 404*A*.
RZEZACZ, P., coal sampling, 532*A*.

SAITO, S., wear tests, 480*A*.
SALZER, F., scaling of iron, 421*A*.
SANDELL, E. B., determination of manganese in steel, 529*A*.
SANDERSON, L.:
cobalt magnet steels, 505*A*.
zirconium, 493*A*.
SANKEY, G. H., obituary notice, 320.
SAXTON, R.:
drawing alloy steel, 415*A*.
drawing high-speed steel, 414*A*.
drawing nickel-iron alloys, 414*A*.
drawing stainless steel, 415*A*.
drawing wire shapes, 414*A*.
effect of elements on steel wire, 415*A*.
SCHAFMEISTER, P., corrosion-resistant steel, 519*A*.
SCHEIBE, G., spectrum analysis of iron-silicon system, 531*A*.
SCHEIL, E.:
austenite transformation, 513*A*.
iron-nickel alloys, 515*A*.
martensite needles, 510*A*.
transformations in iron-manganese alloys 514*A*.
SCHEIL, M. A., resistance alloys, 518*A*.
SCHERER, R.:
creep tests, 484*A*.
high-speed steel, 427*A*.
SCHICHTEL, resistance alloys, 517*A*.
SCHMIDT, E. K. O., corrosion of metals in contact, 524*A*.
SCHMIDT, W. E., X-ray apparatus, 507*A*.
SCHMIDTILL, E., iron ore in Dogger sandstone, 323*A*.
SCHMUCKLER, E. H., tests of welds, 441*A*.
SCHNEIDER, C. P. E., use of high-frequency currents for heating, 385*A*.
SCHÖNROCK, K., fatigue tests of welds, 441*A*.
SCHÖNTAG, A., spectrum analysis of iron-silicon system, 531*A*.
SCHÖPF, A., roller bearings, 402*A*.
SCHRADER, H.:
case-hardening alloy steel, 420*A*.
heat treatment of tool steel, 427*A*.
SCHROEDER, W. C., embrittlement of boilers, 478*A*.
SCHULTE, F., thickening of wash oil, 348*A*.
SCHULTES, W., determination of calorific value, 333*A*.
SCHULZ, H., roller bearings, 402*A*.
SCHULZE, A.:
electric resistance alloys, 505*A*, 517*A*.
transformations in iron, 511*A*.
SCHWARTZ, H. A., graphitising reactions, 468*A*.
SCHWARTZ, N., iron-nickel alloys, 515*A*.
SCHWIEDESSEN, H., thermotechnological calculations, 334*A*.
SCHWINDT, K., oxygen-phosphorus equilibrium, 358*A*.
SEARLE, H. E., corrosion tests, 522*A*.
SEEBERGER, W., high-pressure boilers, 335*A*.
SEEGER, A., welded plate girders, 440*A*.
SEFING, F. G., effect of grain-size on carbon steel, 508*A*.
SEKIGUCHI, H., corrosion of mild steel, 525*A*.
SENFTER, E., insulating bricks, 330*A*.

SERVANT, R., photomicrographs, 507*A*.
SERVICE, T. M., steel forgings, 395*A*.
SHANDS, E. H., pickling of sheet iron, 447*A*.
SHORE, A. J., cupola mixtures, 363*A*.
SHORROCK, J. N., texture of refractories, 329*A*.
SIMS, L. G. A., magnetic properties, 503*A*.
SINCLAIR, T., Hoyois washery, 341*A*.
SINNATT, F. S.:
hydrogenation of coal, 352*A*.
low-temperature carbonisation, 346*A*.
SKROCH, K., sheet mill practice, 405*A*.
SLACK, S. B., contraction of welds, 443*A*.
SLADE, G., microscope, 375*A*
SLATTENSCHEK, A., effect of prestressing on cast iron, 461*A*.
SLEE, F. J., tests of lubricants, 402*A*.
SLOMAN, H. A., determination of oxygen in steel, 392*A*.
SMITH, A. J. N., effect of copper in malleable cast iron, 465*A*.
SMITH, G. F., determination of chromium in stainless steel, 529*A*.
SMITH, G. P. determination of chromium in stainless steel, 529*A*
SMITHELLS, C. J., diffusion of gases in metals, 492*A*.
SNOEK, J. L., textures of nickel-iron alloys, 503*A*.
SÖHNCHEN, E., copper steel, 497*A*.
SOMIN, B. E., nickel-aluminium magnet steel, 504*A*.
SOPWITH, D. G., fatigue tests of safety hook, 491*A*.
SOSMAN, R. B., equilibrium relationships of Fe_3O_4, Fe_2O_3 and oxygen, 421*A*.
SPELLER, F. N., effect of coatings on life of metals, 448*A*.
SPENCER, W. H., chilling properties of cast iron, 464*A*.
SPITTALL, D., elected member, 9.
SPOWERS, W. H., jun., dross losses in galvanising, 452*A*.
STÄBLEIN, F.:
irradiation of weld with mesothorium, 441*A*.
magnet steel tester, 503*A*.
STANLEY, T. R., moulding sand, 366*A*.
STECCANELLA, A., standardisation of impact test bars, 472*A*.
STECK, R., pyrometers, 416*A*.
STEEVER, A. M.:
drop-forging practice, 395*A*.
forge furnaces, 393*A*.
grinding cracks, 481*A*.
STEFFES, M., turbo-blowers, 355*A*.
STEINITZ, R., magnet steel tester, 503*A*.
STEINWEHR, H. VON, transformations in iron, 511*A*.
STERKY, G. L. T., elected member, 9.
STERN, J., electrochemical potential of iron, 520*A*.
STERNE, C. M., corrosion of air-conditioning equipment, 527*A*.
STEVENSON, W. W.:
determination of nitrogen in steel, 392*A*.
gases in steel, 392*A*.
STOECKER, J., reducibility of sinter, 358*A*.
STONE, C. P., enamelling of cast iron, 456*A*.
STONE, R. H. crucible furnaces, 376*A*.
STOUT, L. E., electrodeposition of tin, 450*A*.
STRANSKI, J. N., crystal growth, 508*A*.
STRELOW, W., electrodes for arc welding, 433*A*.
STROM, H., alloy cast iron in mining, 468*A*.
STUART, H. W., centrifugal castings, 370*A*.
SULLIVAN, J. D., residual metals in open-hearth charges, 379*A*.
SUSLOV, B. M., blast-furnace practice in Russia, 354*A*.
SUTTON, H., fatigue properties of patented steel wire, 166*D*.
SVETCHNIKOFF, B., elected member, 9.
SWEETSER, R. H., slag control in blast-furnace, 384*A*.
SWINDEN, T.:
determination of nitrogen in steel 392*A*.
fatigue properties of patented steel wires, 169*D*.
gases in steel, 392*A*.
ingot moulds, 391*A*.
SYKES, W. P., iron-tungsten and iron-molybdenum systems, 516*A*.

TAMMANN, G., effect of temperature on deformation of metals, 396*A*.
TANGERDING, W., grain-growth in carbonyl iron, 508*A*.
TATON, power stations for welding, 432*A*.

TETRICK, J. D., opacity of enamels, 457*A*.
THALÉN, G., hardening depth of tool steel, 426*A*.
THANHEISER, G., reactions in basic process, 381*A*.
THAU, A., regeneration of wash oil, 349*A*.
THIEL, F., seamless tubes, 410*A*.
THOM, W. T., jun., coal, oil and gas in Montana, 323*A*.
THOMPSON, F. C.:
Paper, "The Use of the Hele-Shaw Apparatus in the Investigation of the Flow of Metals." *See* Herbert, A. M.
fatigue properties of patented steel wires, 167*D*.
THOMSON, A. F., elected member, 9.
THORNTON, W. M., jun., estimation of iron, 529*A*.
THRELFALL, C. R. F., firebricks, 327*A*.
THUM, A., strength due to shape, 469*A*.
THYSSEN, H., desulphurisation of iron, 384*A*.
TICHY, G., testing of tube seams, 441*A*.
TILEMANN, T., welding of malleable cast iron, 439*A*.
TIMOCHIN, A. A., electrodeposition of chromium, 451*A*.
TOLLEMACHE, H. D., pulverised coal, 342*A*.
TONN, W., deep-drawing tests, 397*A*.
TOPLIS, H., case-hardening, 419*A*.
TOWNSHEND, H. W., welding of ships, 440*A*.
TRANTIN, J., small open-hearth furnaces, 372*A*.
TRENT, E. M., segregation in ingots, 392*A*.
TRICKETT, J., hardening of hack-saw blades, 428*A*.
TRIGGER, K. J., effect of grain-size on carbon steel, 508*A*.
TRIMBLE, D. D., welding of road-making machinery, 438*A*.
TRUESDALE, E. C., iron-zinc system, 516*A*.
TURNER, T. H., flow of metals, 126*D*.
TWEEDY, S., fusibility of coal ash, 334*A*.
TWIGGER, T. R., cylinder liners, 467*A*.

UHLEMANN, K., effect of high temperatures on steel under stress, 483*A*.
ULFERT, W., machining of chromium-nickel steel, 481*A*.
UNDERWOOD, C. M., X-ray examination of castings, 440*A*.
UNGERSBÖCK, O., electrolytic pickling, 446*A*.
UPTHEGROVE, C., effect of grain-size on surface decarburisation of steel, 423*A*.

VALLOT, E., fracture of pylon, 502*A*.
VAN CAMPEN, J. H., wide strip mills, 407*A*.
VAN DEN BOSCH, intergranular corrosion of chromium-nickel steel, 526*A*.
VAN EWIJK, L. J. G., penetration of white metals into stressed steels, 65*D*.
VAN HORN, K. R., constituents in steel, 509*A*.
VIALLE, intergranular corrosion of chromium-nickel steel, 526*A*.
VICKERS, A. E., slagging of refractories, 329*A*.
VICKERS, S. B., inclusions in ingots, 392*A*.
VILELLA, J. R., constituents in steel, 509*A*.
VOGELSANG, F., moulding of cylinder covers, 369*A*.

WACHÉ, X., tempering of iron-nickel-chromium alloys, 430*A*.
WADLING, J. P., tests of welds, 442*A*.
WAGNER, H. A., Saar metallurgical works, 360*A*.
WAGNER, H. W., gas cleaning, 351*A*.
WAITE, L. M., extrusion of ferrous metals, 397*A*.
WALDRICH, O., elected member, 9.
WALDRON, L. J., corrosion tests, 522*A*.
WALL, T. F., electromagnetic tests of wire, 482*A*.
WALTER, K., steel containers for motor fuels 444*A*.
WALTERS, F. M., jun., iron-manganese alloys, 514*A*.
WALTHER, H. F., slag control in basic electric practice, 385*A*.
WALZEL, R., metallurgy of iron, 506*A*.
WAPENHENSCH, A., tap-hole clay gun, 354*A*.
WARD, S. G., elected associate, 9.
WARREN, A. G., magnetic inspection of defects in castings, 476*A*.
WARRENTRUP, H., thermal conductivity of sheets, 482*A*.

WARRICK, D. L., pitting of metals during pickling, 448*A*.
WASHBURN, T. S., slag control in rail steel making, 385*A*.
WASSERMAN, G., α-γ transformation, 511*A*.
WATSON, J. D., cast iron in machine construction, 467*A*.
WATSON, L. A., screw-down equipment, 399*A*.
WATTS, H. T., continuous furnaces, 393*A*.
WATTS, O. P., effect of arsenic on corrosion of iron, 525*A*.
WAULTHIER, L., elected member, 9.
WEBBER, A. F., waste-heat boilers, 336*A*.
WEBER, E., section mills, 403*A*.
WECKSTEIN, S. M.:
precision mills, 407*A*.
roller bearings, 400*A*.
WEGEMANN, C. H., coal, oil and gas in Montana, 323*A*.
WEGMANN, L., rod and wire mills, 403*A*.
WEIL, moulding machines, 365*A*.
WEILER, J. F., reaction of bromine with coal, 344*A*.
WEINLAND, C. E., heat losses in furnaces, 337*A*.
WELDON, M. J., effect of furnace atmosphere on molybdenum high-speed steel, 422*A*.
WELLBURN, E. R., elected associate, 9.
WELLS, C.:
alpha-gamma transformation, 512*A*.
iron-manganese alloys, 514*A*.
WELTER, J., high-tensile steels, 494*A*.
WELTER, R., turbo-blowers, 355*A*
WENTRUP, H.:
desulphurisation of iron, 384*A*.
iron - phosphorus - oxygen system, 515*A*.
oxygen - phosphorus equilibrium, 358*A*.
WERNICK, S., anodic deposits, 449*A*.
WERZ, W., separation of molybdenum in alloy steel, 529*A*.
WESCOTT, B. B., selection of sucker-rods, 498*A*.
WESEMANN, F., open-hearth furnace ports, 377*A*.
WEST, C. L., "Elfurno" gas atmosphere, 423*A*.
WESTGREN, A.:
chromium and manganese carbides, 508*A*.
iron-tungsten and iron-molybdenum alloys, 516*A*.
WEVER, F., X-ray examination of metals, 507*A*.
WHITE, A. E.:
creep of steel, 484*A*.
effect of superheating on cast iron, 464*A*.
properties of steel at high temperatures, 485*A*.
WHITE, J., slag systems, 387*A*.
WHITELEGG, F., wire-working plant, 415*A*.
WHITELEY, J. H.:
inclusions in steel, 275*D*.
stressed metals at high temperatures, 232*D*.
WIEST, P., magnet steels, 505*A*.
WIESTER, H. J., austenite transformation in steel, 512*A*.
WILCOX, R. J., heat-resistant alloy, 518*A*.
WILCOX, R. L., iron-zinc system, 516*A*.
WILLE, F.:
blast-furnace stoves, 355*A*
gas cleaning, 351*A*.
WILLIAMS, C. E., copper stools for ingot moulds, 391*A*.
WILLIAMS, T. E. H., elected associate, 9.
WILLIAMSON, J. N., coal-cleaning plants, 339*A*.
WILSON R. L.:
alloy steels for oil refineries, 498*A*.
creep of steel, 484*A*.
properties of steel at high temperatures, 485*A*.
WILTEN, H. M., embrittlement of chromium steel, 478*A*.
WINDER, A. B., steel forgings, 395*A*.
WINTER, H., determination of naphthalene, 532*A*.
WINTERBOTTOM, A. B.:
scaling of steel, 72*D*.
flow in extrusion, 130*D*.
properties of patented steel wires, 170*D*.
stressed metals at high temperatures, 233*D*.
WISHART, H. B., fatigue tests at low temperatures, 489*A*.
WITTENBERG, H., sintering of ores, 325*A*.
WOHLFAHRT, S.,:
feeder heads, 391*A*.
insulation of furnaces, 331*A*.
WOOD, T. J., thermal expansion of nickel cast iron, 462*A*.
WOOD, W. P., austenitic grain-size in cast iron, 462*A*.
WOOTEN, L. A., determination of sulphur, 530*A*.

WRATZKY, M., energy consumption in piercing mills, 409*A*.
WRIGHT, A. R. M., elected member, 9.
WRIGHT, J. T., elected member, 9.
WRIGHT, T. A., spectrum analysis, 530*A*.
WRIGHT, W. J., coal in New Brunswick, 322*A*.
WRUZEWITSCH, S. A., corrosion with oxygen depolarisation, 521*A*.
WYNNE, H. A., controlled atmospheres in furnaces, 418*A*.

YAMAGUCHI, M., nickel-chromium plating, 451*A*.
YAMAMOTO, N., wear tests, 480*A*.
YENSEN, T. D.:
magnetic ageing of iron, 477*A*.
YENSEN, T. D.:
magnetic properties of iron-silicon alloys, 504*A*.
ZAVARINE, I. N., transformations in carbon steel, 514*A*.
ZEYEN, K. L., welding of steel, 434*A*, 436*A*.
ZIEGLER, F. K., X-ray examination of metals, 507*A*.
ZIEGLER, N. A.:
magnetic ageing of iron, 477*A*.
magnetic properties of iron-silicon alloys, 504*A*.
ZIELER, H., recovery of vanadium from pig iron, 385*A*.
ZIMA, A. G., steels for oil-well equipment, 499*A*.
ZIMMERMAN, J. H., cutting of structural steel, 444*A*.
ZINZADZE, Ch., determination of phosphorus, 529*A*.

Printed for THE IRON AND STEEL INSTITUTE *by arrangement with* THE IRON AND COAL TRADES REVIEW *by* F. J. PARSONS, LTD., *London and Hastings.*